Vol. 910 Number 2

OFFICIAL GAZETTE

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UNITED STATES PATENT OFFICE

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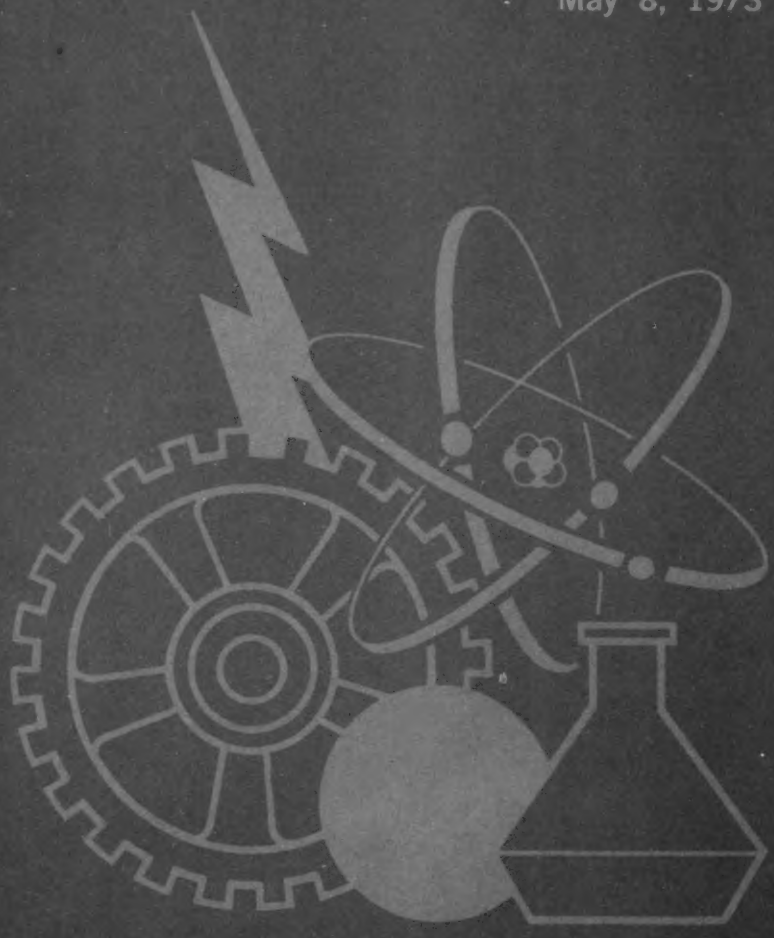
PATENTS

May 8, 1973



U. S. DEPARTMENT OF COMMERCE
Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

May 8, 1973 Volume 910 Number 2

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PATENT OFFICE NOTICES

Noted BB V

TITLE 37—PATENTS, TRADEMARKS AND COPYRIGHTS

Chapter I—Patent Office, Department of Commerce

PART I—RULES OF PRACTICE IN PATENT CASES

Implementation of Inventor's Certificate Legislation Serial Number and Filing Date

A proposal was published at 37 FR 25172 to add a new paragraph (c) to § 1.55 (37 CFR 1.55(c)). Pursuant to this notice, comments have been received from interested persons. Full consideration has been given to all matter presented. The proposed amendment is hereby adopted without change and is set forth below.

The new paragraph implements Public Law 92–358, dated July 28, 1972, which accords rights of priority under certain conditions to a U.S. patent application where the claims for priority are based on an earlier filed application for an inventor's certificate. It would insure that the right of priority would be granted for an inventor's certificate involving subject matter for which an applicant in the country of earlier filing has an option to file for either a patent or an inventor's certificate, as required by the new legislation.

Effective date.—This regulation shall be effective on the date when Articles 1–12 of the Paris Convention of March 20, 1883, for the Protection of Industrial Property, as revised at Stockholm, July 14, 1967, come into force with respect to the United States and shall apply only to applications thereafter filed in the United States.

Dated April 2, 1973.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Approved April 6, 1973.

RICHARD O. SIMPSON,
Acting Assistant Secretary for Science and Technology.

§ 1.55 Serial number and filing date of application.

* * * * *

(c) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his attorney or agent, when submitting a claim for such right as specified in paragraph (b) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

[FR Doc. 73–7172; Filed 4–12–73; 8:45 am]

Published in 38 F.R. 9297; Apr. 13, 1973

Mail Delays and Petitions to Revive

Since applications that become abandoned unintentionally present burdens to both the Patent Office and the applicant or his representatives, a simplified procedure has been devised to alleviate these burdens when the abandonment results from a delay in the mails. This procedure provides for an automatic petition to revive or petition to accept the delayed payment of issue fee.

It is suggested that when a communication, complying with the circumstances enumerated below, is mailed to the Patent Office more than three calendar days prior to the due date, a conditional petition be attached to the communication. If the communication is received in the Patent Office after the due date and the application becomes abandoned, the conditional petition will become effective, subject to the following requirements. The petition must include (1) an authorization to charge a deposit account for any required fees, including the petition fee (35 U.S.C. 41(a) 7), and (2) an oath or declaration signed by the person mailing the communication and also signed by the applicant or his registered representative stating that the communication and petition were either placed in the United States mail as first class or air mail, or placed in the mail outside the United States as air mail. Since mail handled in this manner may reasonably be expected to reach the Patent Office within three days of posting, any mail delays beyond such time will be considered to constitute unavoidable delay and sufficient cause to grant a petition to revive (35 U.S.C. 133) or a petition to accept delayed payment of an issue fee (35 U.S.C. 151).

The circumstances under which this procedure may be used are those where the communication, if timely filed, (1) would be a proper and complete response to an action or request by the Patent Office, and (2) would stop a period for response from continuing to run. Accordingly, this procedure would be appropriate for:

1. A response to a non-final Office action.
2. A response to a final Office action in the form of an amendment that cancels all rejected claims or otherwise prima facie places the application in condition for allowance.
3. A notice of appeal and requisite fee.
4. An appeal brief, in triplicate, and requisite fee.
5. A base issue fee.
6. A balance of issue fee.

Examples of which this procedure would not be appropriate and will not apply include:

1. Application papers.
2. A response to a final Office action other than that indicated in categories 2 and 3, above.
3. Extensions of time.
4. Petitions for delayed payment of either the issue fee or balance of issue fee.
5. Amendments under Rule 312.
6. Priority documents.

Normal petition practices are not affected in those situations where this procedure is either not elected or appropriate.

A suggested format for the conditional petition is shown below:

Applicant(s) ---------- ☐ Petition to revive
Serial No. ----------
Date Filed ---------- ☐ Petition to accept delayed payment of issue fee
For ----------

I hereby certify that the attached communication is being deposited in

☐ the United States mail as first class or air mail
☐ the mail outside the United States as air mail

in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on ----------, which date is more than three (3) calendar days prior to the due date from ----------, by ----------.
(Location) (Name of Individual)

In the event that such communication is not timely filed in the United States Patent Office, it is requested that this paper be treated as a petition and that the:

☐ delay in prosecution be held unavoidable—35 U.S.C.133.
☐ delayed payment of the fee be accepted—35 U.S.C. 151.

The petition fee required by 35 U.S.C. 41(a) 7 is authorized to be charged to Deposit Account No. ---------- in the name of ----------.

The undersigned declare further that all statements made herein are true, based upon the best available information;

and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date _____ _____
(Signature of applicant or signature and registration number of Registered Representative)
And
Date _____ _____
(Signature of person mailing, if other than the above)

April 13, 1973. WILLIAM FELDMAN,
Deputy Assistant Commissioner for Patents.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,129,332, D. Mastini, TELEPHONE SYSTEM, **filed** July 27, 1961, D.C., S.D.N.Y., Doc. 61–C–2677, *Domenico Mastini* v. *General Telephone and Electronics Corporation.* Order, action is dismissed for lack of prosecution, Oct. 20, 1972.

2,441,000, Te Grotenhuis and Frost, METHOD OF MAKING A MIX OF CARBON BLACK AND A SYNTHETIC RUBBERY POLYMER OF A CONJUGATED DIOLEFIN, **filed** Oct. 28, 1966, D.C., N.D. Ohio (Cleveland), Doc. C666–774, *Theodore A. Te Grotenhuis* v. *The Firestone Tire & Rubber Company.* Stipulation and order dismissing case with prejudice, Nov. 13, 1972.

2,507,347, R. R. Myers, Jr., METHOD OF PRODUCING ARCULAR PRINTING PLATES; **2,800,856,** same, METHOD OF MAKING PRINTING PLATES; **2,814,990,** same, METHOD OF PRODUCING PRINTING PLATES; **3,062,139,** same, METHOD OF AND MEANS FOR PRODUCING PRINTING PLATES, **filed** Dec. 15, 1970, D.C., W.D.N.Y. (Buffalo), Doc. C–1970–585, *Printing Plate Supply Co.* v. *Arcata Graphics Corporation.* Decree and judgment filed Oct. 2, 1972.

2,784,955, C. E. Compton, ROTARY MINING MACHINE CUTTER HEAD WITH REAR HELICALLY EXTENDING TRANSVERSE OPENING; **2,935,309,** V. J. McCarthy, MINING MACHINE HAVING INDEPENDENTLY OPERABLE SKIDS, **filed** May 16, 1969, D.C., S.D. W. Va. (Huntington), Doc. 2578, *The Salem Tool Company* v. *Charles E. Compton, Joy Mfg. Co., and Republic Corporation.* Action dismissed by agreement of the parties, order entered Oct. 19, 1972.

2,800,856. (See 2,507,347.)

2,814,990. (See 2,507,347.)

2,935,309. (See 2,784,955.)

3,062,139. (See 2,507,347.)

3,141,872, Natta, Pino and Mazzanti, POLYMERIZATION CATALYST AND STEREOSPECIFIC POLYMERIZATION OF PROPYLENE THEREWITH, **filed** Nov. 16, 1972, D.C. Del. (Wilmington), Doc. 4517, *Montecatini Edison, S.p.A.* v. *Enjay Chemical Co.*

3,236,390, H. F. J. Sprengel, SHIP'S CARGO BOOM WITH PENDULUM PURCHASE BLOCK FITTING, **filed** Jan. 9, 1967, D.C. Md. (Baltimore), Doc. 17959–W, *Blohm & Voss AG* v. *Grace Line, Inc.* Judgment, claims 1, 2, 3, 14, 15 and 18 valid. Defendant infringes claims 14, 15 and 18; defendant's counterclaims are dismissed, Nov. 13, 1972.

3,262,027, Zaleske and Churchill, SOLENOID STRUCTURE AND MOUNTING MEANS THEREFOR, **filed** Nov. 3, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2786, *Automatic Switch Company* v. *Emerson Electric Co.*

3,304,199, Faber, Francis, Holmes and Boykin, ELECTRICAL RESISTANCE ELEMENT, **filed** Nov. 10, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–2702–FW, *Bourns, Inc.* v. *CTS Corporation.*

3,316,574, R. L. Pare, ROAD EXPANSION JOINT; **Re. 26,733,** J. A. Welch, ELASTOMERIC EXPANSION JOINT, **filed** Nov. 9, 1972, D.C., W.D.N.Y. (Buffalo), Doc. C-1972–592. *Watson-Bowman Associates, Inc.* v. *The General Tire & Rubber Company.*

3,405,268, D. C. Brunton, RADIANT ENERGY ABSORPTION GAGE FOR MEASURING THE WEIGHT OF A BASE MATERIAL AND THE CONTENT OF A MATERIAL SORBED BY THE BASE MATERIAL, **filed** Aug. 23, 1972, D.C., D.C., Doc. 1691–72, *Brum Sensor Systems, Inc.* v. *Sybron Corporation.*

3,421,752, A. S. Folino, PROCESS OF PRINTING NUMBERS ON FORMS, **filed** Nov. 13, 1972, D.C., S.D. Ohio (Dayton), Doc. 4338, *Arthur S. Folino* v. *Reynolds & Reynolds.*

3,498,215, L. D. Brinkman, LAMINATING DEVICE; **3,513,521,** A. L. Fritz, APPARATUS FOR ASSEMBLING AND SECURING T-EDGING, **filed** Oct. 21, 1971, D.C. Ariz. (Phoenix), Doc. C–71–585 PHX, *Royal Industries, Inc.* v. *Unique Machine Tool Co., Inc. et al.* Complaint and counterclaims are dismissed with prejudice as to past acts only, Nov. 7, 1972.

3,513,521. (See 3,498,215.)

3,540,229, P. H. Bunten, AIR COOLING APPARATUS, **filed** May 11, 1972, D.C., S.D. Fla. (Miami), Doc. 71–1154–C–EC, *Paul H. Bunten and Repco Products Corporation* v. *Weathermatic Corporation.* Court finds the patent invalid, Nov. 16, 1972.

3,565,063, S. J. Popeil, METHOD FOR SETTING HAIR, **filed** Mar. 9, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c591, *Popeil Brothers, Inc.* v. *Sperry Rand Corporation.* Order complaints in 70c295, 71c979, 71c591 and 71c1352 dismissed, Nov. 17, 1972.

3,605,178, E. E. Hoffmann, LOIN PULLING KNIFE, **filed** Nov. 14, 1972, D.C. Minn. (St. Paul), Doc. 3–72–C–313, *Edwin E. Hoffmann* v. *Swift & Company.*

3,608,646, E. C. Ryan, ROTARY HOE, **filed** Nov. 9, 1972, D.C., N.D. Ohio (Cleveland), Doc. C72–1215, *Western Litho Plate & Supply Co.* v. *National Machine Company.*

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, **filed** Oct. 13, 1972, D.C., W.D.N.C. (Charlotte), Doc. C–C–72–234, *Tights, Inc.* v. *Chadbourn, Inc.*

3,696,813, R. M. Wallach, CRYOSURGICAL INSTRUMENT, **filed** Nov. 7, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1765–C–PF, *Cryomedics, Inc.* v. *Gynemed, Inc.*

Re. 26,733. (See 3,316,574.)

Certificates of Correction for the Week of May 8, 1973

PP. 3,054	3,660,901	3,686,649	3,695,737
D. 224,204	3,661,296	3,686,879	3,695,779
D. 225,063	3,661,941	3,686,949	3,696,014
D. 225,322	3,663,251	3,687,102	3,696,069
Re. 27,440	3,663,803	3,687,186	3,696,083
3,502,766	3,665,242	3,687,272	3,696,273
3,516,060	3,666,513	3,687,920	3,696,409
3,555,306	3,671,085	3,688,031	3,696,631
3,567,688	3,671,159	3,688,073	3,696,635
3,573,838	3,673,381	3,688,130	3,696,810
3,575,062	3,674,157	3,688,132	3,697,043
3,583,576	3,674,665	3,688,278	3,697,265
3,591,058	3,674,749	3,688,525	3,697,417
3,591,667	3,677,420	3,688,633	3,697,821
3,594,164	3,677,713	3,688,732	3,697,843
3,594,165	3,677,949	3,688,971	3,697,947
3,599,357	3,678,157	3,689,152	3,697,961
3,604,472	3,678,399	3,689,474	3,698,004
3,608,717	3,678,828	3,689,495	3,698,479
3,609,158	3,679,393	3,689,507	3,698,820
3,610,904	3,679,745	3,689,523	3,698,880
3,612,865	3,679,942	3,689,553	3,699,057
3,613,330	3,680,195	3,689,602	3,699,384
3,614,269	3,680,738	3,689,648	3,699,753
3,615,916	3,680,772	3,689,664	3,699,910
3,615,975	3,680,914	3,689,775	3,700,013
3,616,450	3,681,287	3,690,113	3,700,098
3,619,503	3,681,372	3,690,451	3,700,438
3,620,947	3,681,374	3,690,601	3,700,515
3,622,631	3,681,533	3,690,954	3,700,599
3,623,442	3,681,738	3,691,169	3,700,656
3,624,016	3,682,019	3,691,192	3,700,675
3,624,392	3,682,136	3,691,277	3,700,687
3,627,459	3,682,243	3,691,315	3,700,739
3,631,585	3,682,349	3,691,456	3,701,135
3,632,310	3,682,423	3,691,759	3,701,158
3,632,467	3,682,497	3,691,868	3,701,275
3,635,666	3,682,545	3,692,340	3,701,289
3,636,748	3,682,964	3,692,382	3,701,504
3,637,073	3,682,995	3,692,522	3,701,804
3,637,446	3,683,175	3,692,531	3,702,028
3,637,646	3,683,399	3,692,663	3,702,118
3,640,155	3,683,490	3,692,774	3,702,175
3,640,829	3,683,559	3,692,889	3,702,345
3,640,968	3,683,755	3,692,896	3,702,499
3,641,358	3,683,871	3,692,971	3,702,616
3,641,792	3,683,939	3,693,109	3,702,640
3,642,587	3,684,067	3,693,411	3,702,716
3,645,522	3,684,379	3,693,479	3,702,781
3,647,819	3,684,501	3,693,511	3,703,014
3,649,664	3,684,505	3,693,914	3,703,153
3,650,093	3,684,508	3,693,916	3,703,734
3,651,334	3,684,509	3,694,191	3,703,741
3,651,999	3,684,517	3,694,237	3,704,068
3,653,393	3,684,521	3,694,330	3,704,602
3,654,109	3,684,637	3,694,357	3,705,121
3,655,375	3,684,676	3,694,390	3,705,133
3,655,388	3,684,719	3,694,555	3,705,216
3,655,683	3,685,373	3,694,998	3,705,417
3,656,246	3,685,520	3,695,099	3,705,421
3,657,190	3,685,652	3,695,406	3,705,583
3,657,324	3,685,706	3,695,422	3,705,759
3,657,471	3,685,723	3,695,423	3,705,845
3,659,284	3,686,047	3,695,468	3,706,146
3,659,958	3,686,347	3,695,478	3,706,894
3,660,677	3,686,365	3,695,501	
3,660,678	3,686,628	3,695,627	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Reissue Patent No. 25,695, M. A. Cook and H. E. Farnam, Jr., EXPLOSIVE COMPOSITION COMPRISING AMMONIUM NITRATE AND HEAT-PRODUCING METAL, decided May 29, 1969, Interference No. 95,416, claim 9.

Patent No. 3,287,224, W. B. Loewenstein, LARGE FAST NUCLEAR REACTOR, decided Nov. 30, 1972, Interference No. 97,345, claims 1 and 3.

Patent No. 3,389,404, R. A. Koster, CONTROL/DISPLAY APPARATUS, decided Nov. 7, 1972, Interference No. 96,980, claim 1.

Patent No. 3,402,223, J. B. L. Hollingsworth, HIGH MOLECULAR WEIGHT ETHYLENE COPOLYMER AND LOW MOLECULAR WEIGHT ETHYLENE-VINYL ACETATE COPOLYMER BLEND, decided Nov. 1, 1972, Interference No. 97,285, claims 3, 6 and 7.

Patent No. 3,405,394, J. F. Dirac, CONTROLLED REGISTER ACCESSING, decided Nov. 7, 1972, Interference No. 97,295, claims 1, 2, 3, 4, 5, 6, 8, 9, 10, 11 and 13.

Patent No. 3,489,370, B. Mouissie, SELF-THREADING CINEMATOGRAPHIC PROJECTOR WITH FILM-MAGAZINE, decided Jan. 18, 1973, Interference No. 97,930, claims 1 and 3.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA patent licensing regulations.

Copies of patent applications, either paper (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title. Inquiries and requests for licensing information should be directed to the address cited on the first page of each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each. Inquiries and requests for licensing information should be directed to the "Assignee" as indicated on the copy of the patent.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE INTERIOR

Patent application 316,216. Electrolytic Preparation of Zirconium and Hafnium Diborides Using a Molten, Cryolite-Base Electrolyte. Filed December 18, 1972. PC $3/MF $0.95.

Patent application 316,217. Electrolytic Preparation of Titanium and Zirconium Diborides Using a Molten, Sodium Salt Electrolyte. Filed January 18, 1972. PC $3/MF $0.95.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Patent application 197,183. Airfoil Shape for Flight at Supersonic Speeds. Filed November 9, 1971. PC $3.50/MF $0.95.

Patent application 318,152. Metabolic Analyzer. Filed December 26, 1972. PC $3.75/MF $0.95.

Patent application 306,652. Capacitance Multiplier and Filter Synthesizing Network. Filed November 15, 1972. PC $3.25/MF $0.95.

Patent application 322,998. Measuring Probe Position Recorder. Filed January 12, 1973. PC $3/MF $0.95.

Patent application 266,771. A Manual Actuator. Filed June 27, 1972. PC $3/MF $0.95.

[FR Doc. 73-6857; Filed 4-10-73; 8:45 am]

Dedication

2,949,292.—*Carl F. Abissi,* Vestal, N.Y. PERFORATING APPARATUS. Patent dated Aug. 16, 1960. Dedication filed Aug. 4, 1972, by the assignee, *International Business Machines Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

Corrected Dedication

3,283,800.—*Franz Ischinger,* Katharinenberg, *Georg Behrmann,* Katzwang, and *Karl Linzenkirchner,* Ingolstadt, Germany. WHEEL FOR PNEUMATIC TIRES. Patent dated Nov. 8, 1966. Dedication filed Nov. 29, 1972, by the assignee, *Zweirad Union AG.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Nov. 14, 1972.

Patents Available for Licensing or Sale

D. 222,363. DECORATIVE HANGING INCLUDING SKELETAL FRAMEWORK. Clifton Bullard, 310 Prescott Place, Plainfield, N.J., 07063.

3,082,571. TOY. John E. Lewis, ASSN, San Francisco, Calif., 96307.

3,465,373. HOSPITAL BED. Harriet A. Wilson, 115 Hilltop Road, Waverly, Pa., 18471.

3,696,619. ANTISMOG DEVICE FOR CLEANING, BURNING AND MUFFLING THE EXHAUST GASES AND ENGINE COMPARTMENT FUMES OF INTERNAL COMBUSTION ENGINES. Juan Rosa, Box 165, New York, N.Y., 10036.

3,712,626. BARREL POOL APPARATUS, INCLUDING SPRING PROJECTOR. John Rondeau, 306 Avalon Ave., Santa Cruz, Calif., 95060.

3,714,734. TOY AIRCRAFT. John E. Livingston, 502 Camp Ave., New Albany, Ind., 47150.

The following 3 patents are offered by: Fred E. Sanders, 11612 Saywell Ave., Cleveland, Ohio, 44108.

3,488,473. ELECTRIC BEVERAGE HEATER.

3,514,579. ELECTRIC SYRUP WARMER.

3,624,350. TURBO ELECTRIC FURNACE.

General Motors Corporation is prepared to grant non-exclusive licenses under the following 5 patents upon reasonable terms.

Application for license may be addressed to: The Director, Patent Section, General Motors Bldg., 3044 W. Grand Blvd., Detroit, Mich., 48202.

3,537,353. CIRCUIT FOR AUTOMATICALLY OPERATING THE BREECH OF A LARGE CALIBER GUN.

3,538,790. POWER TRAIN.

3,539,920. LOGIC SPEED SWITCH CIRCUITRY.

3,543,588. ACCESSORY INSTALLATION.

3,558,237. VARIABLE TURBINE NOZZLES.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 20 patents.

Inquiries respecting licenses under the following patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

D. 226,274. INDOOR ANTENNA OR SIMILAR ARTICLE.

3,714,709. METHOD OF MANUFACTURING THICK-FILM HYBRID INTEGRATED CIRCUITS.

3,715,212. PHOTOCHROMIC DISPLAY AND STORAGE DEVICE AND METHOD OF OPERATION THEREOF.

3,715,464. HIGH VOLTAGE HOLD-DOWN CIRCUIT.

3,715,477. VIDEO SIGNAL NOISE-LIMITING APPARATUS.

3,715,485. RADIATION SENSING AND SIGNAL TRANSFER CIRCUITS.

3,715,486. SHUTTERING APPARATUS FOR TELEVISION CAMERAS.

3,715,492. HIGH VOLTAGE PROTECTION CIRCUIT.

3,715,493. SERVICE SWITCH ARRANGEMENT FOR IMPROVED INTERLACE PERFORMANCE.

3,715,498. SCANNING SYSTEM WHICH INCLUDES MEANS FOR CONTROLLING PICTURE SAMPLING DENSITY.

3,715,499. DUAL MODE AUTOMATIC FREQUENCY CONTROLLED OSCILLATOR SYSTEM.

3,715,603. THRESHOLD GATE CIRCUITS EMPLOYING FIELD-EFFECT TRANSISTORS.

3,715,621. TRANSISTOR DEFLECTION CIRCUITS UTILIZING A CLASS B, PUSH-PULL OUTPUT STAGE.

3,715,686. PAIRED NONLINEAR ACTIVE ELEMENTS IN A WAVEGUIDE CAVITY ADAPTED TO SUPPORT ORTHOGONAL TE SUB 10 MODE WAVES AND TE SUB 01 MODE WAVES.

3,715,688. TM SUB 01 MODE EXCITER AND A MULTIMODE EXCITER USING SAME.

3,716,206. NUTATION DAMPER.

3,716,429. METHOD OF MAKING SEMICONDUCTOR DEVICES.

3,716,663. COLOR TELEVISION RECORDER-REPRODUCER SYSTEM.

3,716,723. DATA TRANSLATING CIRCUIT.

3,717,821. CIRCUIT FOR MINIMIZING THE SIGNAL CURRENTS DRAWN BY THE INPUT STAGE OF AN AMPLIFIER.

The General Electric Company is prepared to grant nonexclusive licenses under the following 85 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Space Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

3,714,782. GASEOUS NUCLEAR ROCKET ENGINE.

Applications for license under the following 5 patents may be addressed to: Patent Counsel Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky., 40225.

3,320,761. SINGLE EVAPORATOR, SINGLE FAN COMBINATION.

3,324,678. SINGLE EVAPORATION COMBINATION REFRIGERATOR.

3,466,900. AUTOMATIC ADDITIVE DISPENSER.

3,548,444. DOOR CLOSURE DEVICE WITH TIME DELAY MEANS.

3,700,856. HINGED SURFACE HEATING UNIT SYSTEM.

Applications for license under the following 9 patents may be addressed to: General Electric Co., Division Patent Counsel, Automation Business Div., 40 Federal St., Lynn, Mass., 01910.

3,211,967. SOLION WITH GRAPHITE SEPARATORS AND ELECTRODES.

3,211,968. SOLION CELL COMPRISING A POROUS CATHODE ON EACH SIDE OF THE ANODE.

3,273,025. SOLION CELL WITH ELECTRODES ENGAGING CONTRAINER WALL FOR PREVENTING ION-DRIFT.

3,273,026. SOLION CELL HAVING ELECTRODES COLD-SEALED WITH CONTAINER WALL.

3,289,677. ELECTRICAL READOUT INTEGRATOR HAVING POROUS INSULATORS AND SPACED ELECTRODES IN AN ELECTROLYTE.

3,315,236. ELECTROLYTIC SYSTEM FOR SAMPLING AND STORING INFORMATION.

3,377,520. LOW DRIFT, HIGH TEMPERATURES SOLION CELLS.

3,373,268. PROCESS CONTROLLER HAVING ELECTROCHEMICAL CELL INTEGRATING MEANS.

3,377,521. SOLION CELLS HAVING ELECTROLYTE FOR LOW-TEMPERATURE OPERATION.

Applications for license under the following 10 patents may be addressed to: Francis K. Richwine, Patent Counsel, Ordnance Systems Dept., General Electric Co., 100 Plastics Ave., Pittsfield, Mass., 01201.

3,292,499. POWER SYSTEM CONTROL.

3,324,740. POWER SYSTEM CONTROL.

3,588,655. MOTOR CONTROL SYSTEM WITH UNIJUNCTION TRIGGERING CIRCUIT TO COMPENSATE FOR THE NONLINEARITY OF AN SCR AMPLIFIER.

3,601,079. METHOD AND APPARATUS FOR APPLYING DRAG REDUCING ADDITIVES.

3,648,483. OVERLOAD FRICTION COUPLING.

3,649,801. FILM RESISTOR TRIMMER.

3,665,168. ADAPTIVELY CONTROLLED POSITION PREDICTION SYSTEM.

3,685,501. HYDROMECHANICAL LEAD-LAG CONTROL DEVICE.

3,694,631. TWO-RESOLUTION, STRAPPED DOWN INERTIAL REFERENCE SYSTEM.

3,700,986. CO-ORDINATED VOLTAGE CONTROL FOR INDUCTION SERVOMOTORS.

Applications for license under the following 12 patents may be addressed to: Patent Counsel, LSTG–I & MT Divisions, General Electric Co., 1 River Road, Bldg. No. 41, Schenectady, N.Y., 12305.

3,403,892. FULL ARC-PARTIAL ARC TRANSFER SYSTEM FOR ELECTROHYDRAULIC TURBINE CONTROL.

3,519,670. BOROSILICONE MATERIALS.

3,519,671. SILICONE MODIFIED BORATE COMPOSITION AND EPOXY RESINS CURED THEREWITH.

3,670,479. MOMENTUM SLOT CENTRIFUGAL TYPE SEPARATOR.

3,677,905. COMBINED STEAM POWER PLAN AND WATER DISTILLATION SYSTEM.

3,687,872. BOROSILICONE MATERIALS AND EPOXY RESINS CURED THEREWITH.

3,688,872. COMBINED BEARING LUBRICATION-HYDROGEN SEAL SYSTEM FOR GENERATOR.

3,691,416. FLEXIBLE SUPPORT STRUCTURE FOR END WINDING CONNECTIONS.

3,693,036. LIQUID COOLED SERIES LOOP CONNECTOR.

3,697,383. FEEDWATER HEATED AND STRAINER ARRANGEMENT FOR MULTI-EFFECT THIN FILM DESALINATION PLANT.

3,702,561. SYSTEM FOR CHECKING THE PERFORMANCE OF A DYNAMOELECTRIC MACHINE OVERHEATING DETECTOR.

3,702,719. INTEGRATED JOURNAL AND THRUST BEARING.

Applications for license under the following 13 patents may be addressed to: Division Patent Counsel, Electronic Systems Division, General Electric Company, Bldg. 3, Rm. 216, Electronics Park, Syracuse, N.Y., 13201.

3,012,244. RECEIVING SCANNING SYSTEM.

3,488,656. RADIO FREQUENCY HOLOGRAMS.

3,493,352. MAGNETO OPTICAL DISPLAY DEVICE WITH LAYERS NICKEL-CHROMIUM AND GOLD.

3,495,191. MICROWAVE PHASE SHIFTER.

3,500,303. SIGNAL GENERATOR FOR PRODUCING A SET OF SIGNALS OF COMMON FREQUENCY AND ADJUSTABLE PHASE SLOPE.

3,508,262. RADAR SYSTEM.

3,509,577. TANDEM SERIES-FEED SYSTEM FOR ARRAY ANTENNAS.

3,515,879. OPTICAL SENSOR SYSTEM.

3,522,545. DETECTION OF WEAK SIGNALS FROM AMID NOISE.

3,532,906. FAST RECOVERY PULSE CIRCUIT UTILIZING CAPACITOR CHARGED THROUGH SILICON CONTROLLED SWITCH AND DISCHARGED THROUGH TRANSISTOR.

3,534,291. APPARATUS FOR IMMERSION OF FACE PUMPED LASER DEVICES.

3,535,608. BATTERY MAINTENANCE CIRCUIT FOR USE WITH UNRELIABLE CHARGING SOURCES.

3,535,628. MICROWAVE REFLECTOMETER INCLUDING SWEEP GENERATOR DRIVEN AT CONTROLLED NONLINEAR SWEEP RATE AND SPECTRUM ANALYZER SYNCHRONIZED THERETO.

3,536,027. SOUND GENERATOR.

Applications for license under the following 13 patents may be addressed to: Patent Counsel, Contractor Equipment Business Division, General Electric Company, 1285 Boston Ave., Bldg. 21ES, Bridgeport, Conn., 06602.

3,621,453. ELECTROFLUIDIC DELAY LINE OSCILLATOR.

3,623,053. LEAK DETECTING APPARATUS.

3,625,063. PRESSURE RATIO TRANSDUCER.

3,628,372. FLUIDIC ANGULAR POSITION SENSOR.

3,628,552. FLUIDIC AMPLIFIER TORSIONAL SPEED REFERENCE.

3,654,943. VORTEX FLUID AMPLIFIER CIRCUIT FOR CONTROLLING FLOW OF ELECTRICALLY CONDUCTIVE FLUID.

Re. 27,352. FLUID CONTROL SYSTEM.

3,672,231. CLOSED-LOOP FLUIDIC ANALOG ACCELEROMETER.

3,672,388. SENSOR AND CONTROL SYSTEM FOR CONTROLLING GAS PARTIAL PRESSURE.

3,673,413. TIME AND LIGHT CONTROLLED SWITCHING CIRCUIT.

3,678,752. TESTING MEANS FOR FLUIDIC CIRCUIT ELEMENTS.

3,678,881. DEVICE FOR INDICATING CONTAMINATION OF A FLUID SUPPLY TO A FLUIDIC CIRCUIT.

3,678,953. FLUIDIC LEAD-LAG FREQUENCY RESPONSIVE CIRCUIT.

Applications for license under the following 21 patents may be addressed to: General Electric Co., Bldg. 43, Rm. 529, 100 Woodlawn Ave., Pittsfield, Mass., 01201.

2,930,941. SEALING ARRANGEMENT FOR ELECTRICAL INSULATING BUSHINGS.

2,937,359. POWER FACTOR TAP FOR HIGH VOLTAGE BUSHING.

3,101,386. REDUCED HEIGHT ELECTRICAL INSULATING BUSHING WITH SIGHT GLASS.

3,195,087. ELECTRICAL SHUNT REACTOR.

3,229,023. THERMAL UPGRADING OF ELECTRICAL APPARATUS.

3,387,243. INDUCTIVE DISK WINDING WITH IMPROVED IMPULSE VOLTAGE GRADIENT.

3,445,726. PROTECTIVE SYSTEM FOR GAS-FILLED ELECTRICAL APPARATUS.

3,451,503. SOUND REDUCING HOUSE FOR ALTERNATE CURRENT ELECTRICAL APPARATUS.

3,467,931. CONTINUOUS DISK WINDING AND INTEGRAL RADIAL COIL CONNECTOR FOR ELECTRIC TRANSFORMER AND THE LIKE.

2,873,432. WINDING FOR ELECTRICAL APPARATUS.

2,912,658. TURBULENCE PROMOTERS FOR FLUID COOLED ELECTRICAL APPARATUS.

2,937,349. STATIONARY INDUCTION ELECTRICAL APPARATUS.

2,942,213. WINDING ARRANGEMENT FOR ELECTRICAL APPARATUS.

3,059,043. FLUID DUCT FOR ELECTRICAL APPARATUS.

3,137,829. ELECTRICAL APPARATUS.

3,143,699. ELECTRICAL REACTANCE BALANCING APPARATUS.

3,144,628. TRANSFORMER WITH WINDING SECTIONS CONNECTED IN SERIES OR PARALLEL.

3,156,886. MULTIPLE UNIT POWER TRANSFORMER WITH WINDINGS CONNECTED IN PARALLEL.

3,252,119. STATIONARY INDUCTION APPARATUS.

3,270,305. SHIELDED HOUSING WITH VIBRATION CONTROL.

3,291,900. STRAIN INSULATOR FOR DEAD ENDING.

Disclaimers

Design No. 205,737.—*John D. Braught,* Northbrook, Ill. WASTE RECEPTACLE. Patent dated Sept. 13, 1966. Disclaimer filed June 22, 1971, by the assignee, *United States Steel Corporation.*

Hereby enters this disclaimer to claim 1 of said patent.

Design No. 220,256.—*Louis J. Jenn,* Indianapolis, Ind. MULTIPLE UNIT HOUSING STRUCTURE. Patent dated Mar. 23, 1971. Disclaimer filed Oct. 22, 1970, by the inventor.

Hereby disclaims the portion of the term of the patent subsequent to Mar. 23, 1984.

Design No. 222,651.—*Dianne B. Ainslie,* Rochester, N.Y. COMBINED MOTION PICTURE PROJECTOR AND CARRYING CASE THEREFOR. Patent dated Nov. 23, 1971. Disclaimer filed Apr. 26, 1971, by the assignee, *Eastman Kodak Company.*

Hereby disclaims the portion of the term of the patent subsequent to July 28, 1984.

3,647,762.—*Shigeyoshi Hara, Masao Senoo, Tsunemasa Yoshida,* and *Moriya Uchida,* Tokyo, Japan. COPOLYAMIDEIMINE AND COPOLYAMIDEBENZIMIDAZOLE, AND PROCESSES FOR THEIR PREPARATION. Patent dated Mar. 7, 1972. Disclaimer filed Aug. 30, 1971, by the assignee, *Teijin Limited.*

Hereby disclaims the portion of the term of the patent subsequent to June 30, 1987.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 17, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-27-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-03-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-15-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-07-72
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-10-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	9-06-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy. Rocket Fuels; Radio-Active Material.	7-10-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-03-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-22-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-05-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-28-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-10-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	2-07-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	4-10-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-06-72

Expiration of patents: The patents within the range of numbers indicated below expire during May 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,743,442 to 2,748,387, inclusive
Plant Patents..... Numbers 1,472 to 1,480, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MAY 8, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T910,006
METHODS FOR PREPARATION OF INSULATION MATERIALS FROM ALUMINA-SILICA FIBERS

Leonard J. Schuman, Parsippany, Richard P. Brookman, Ridgewood, and Raymond T. Ertle, Pompton Plains, N.J., assignors to Continental Oil Company, Ponca City, Okla.

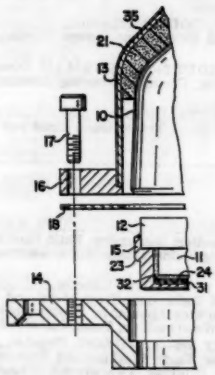
Filed Jan. 6, 1972, Ser. No. 215,921
Int. Cl. D21h *3/66*
U.S. Cl. 162—152
No Drawing. 6 Pages Specification

An improved method for preparing insulation material from alumina-silica fibers which comprises contacting said fibers with an aqueous binder solution containing dispersible alumina and halogenated organic acid in the amounts of 8–12 wt. percent and 0.8–1.2 wt. percent based on the weight of the solution respectively and said halogenated organic acid is monochloroacetic acid.

T910,007
HOUSING FOR RADIATION DETECTOR

Harry Suscheck, Euclid, and Julious M. Menefee, Novelty, Ohio, assignors to Bicron Corporation, Newbury, Ohio

Filed Feb. 9, 1972, Ser. No. 224,660
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R
1 Sheet Drawing. 8 Pages Specification



A metallic protective housing for a radiation detector or the like that includes a scintillation crystal for receiving short wave length radiation, such as gamma radiation, and converting it to a longer-wave-length, visible light image, a photomultiplier tube **10** for converting the visible light image to an electrical signal, and an optical window **12** interposed between the scintillation crystal **11** and the photomultiplier tube. The housing **13** supports the above components in assembled, optically aligned relation and has a layer of impervious chrome plating **35** deposited thereon to provide a surface that may be easily cleaned of any harmful radioactive material.

The accompanying drawing figure is an exploded fragmentary sectional view illustrating the above listed components of the housing and their manner of assembly.

T910,008
ALUMINA FILTRATION

Bruce E. Leach and William C. Ziegenhain, Ponco City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 29, 1972, Ser. No. 240,317
Int. Cl. B01d *37/02*
U.S. Cl. 210—54
No Drawing. 8 Pages Specification

An improvement in the filtration of aqueous alumina slurries is achieved by the addition of a compound selected from the group consisting of modified polyacrylamides and hydrolyzed copolymers of ethylene and maleic anhydride. Desirable results have been achieved wherein up to about 0.10 weight percent of the hydrolyzed copolymers of ethylene and maleic anhydride was added and wherein up to about 0.25 weight percent modified polyacrylamide was added. Lesser concentrations result in less improvement in filtration while higher concentrations tend to thicken the slurry and make filtration and other process operations difficult. The alumina slurry to be filtered may vary widely from trace amounts of alumina to semi-solid slurries, and any suitable filtration method known to the art may be employed.

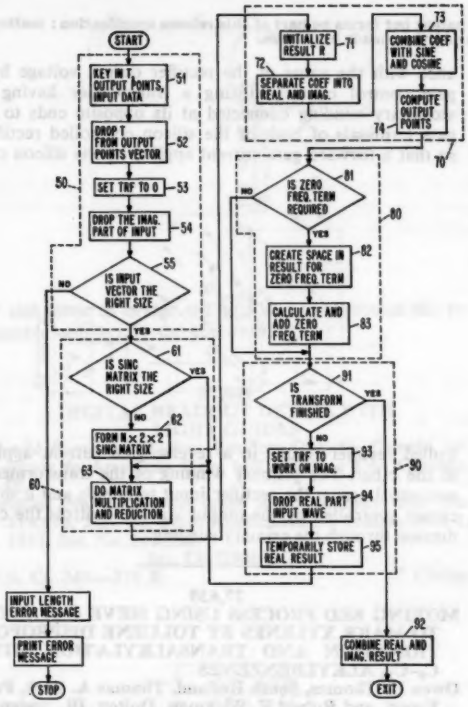
T910,009
SINC/COSINC TRANSFORM—A CONTINUOUS FOURIER TRANSFORM

Robert F. Abramson, Arvada, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 3, 1972, Ser. No. 268,334
Int. Cl. G06f *7/38, 15/34*
U.S. Cl. 444—1
10 Sheets Drawing. 57 Pages Specification

The Fourier transform of a non-periodic wave is calculated by programmed computer using matrix multiplication. The non-periodic wave to be transformed is converted to a staircase waveform where the amplitude of each step in the staircase waveform is the average amplitude of the original wave. Walsh coefficients of the staircase waveform are then computed by matrix multiplication of the Walsh matrix times sample values for the wave where the sample values are the various amplitudes of the staircase wave during separate step or sample intervals. Thereafter, the continuous Fourier transform of a non-periodic wave is calculated by computing the Fourier transform of the Walsh functions. The latter computation is simplified by multiplying the Walsh coefficients by a sinc array and a cosinc (defined hereinafter) array. A further and ultimate simplification of the entire process is accomplished by multiplying the Walsh matrix by an intermingling of the sinc and cosinc arrays. The result is a matrix consisting mostly of zeroes and hereinafter defined as the sinc matrix. Multiplication of the input wave values by the sinc matrix will yield directly sine/cosine coefficients of the Fourier sine/cosine

transforms for the staircase waveform that simulates the input wave. With the coefficients of the Fourier sine/cose transforms defined, the Fourier transform at any frequency may be computed.



T910,010

METHOD OF AND APPARATUS FOR ORIENTING POLYMERIC FILM

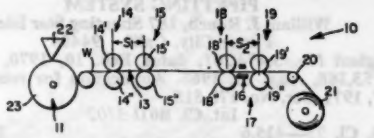
Randolph M. Clark, Circleville, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 113,851, Feb. 9, 1971. This application July 12, 1972, Ser. No. 270,959

Int. Cl. B29d 7/24

U.S. Cl. 264—210 R

2 Sheets Drawing. 7 Pages Specification



A method of orienting a web of polyethylene terephthalate film including the steps of:

casting a molten polymer and quickly quenching it to a temperature at or below its glass transition temperature to produce a web of substantially amorphous film;

first stretching the web of substantially amorphous film at a first stretching temperature between the glass transition temperature and approximately 10° C. above the glass transition temperature by application of a first stretching stress to the web in its direction of movement to partially orient and crystallize the web;

applying a second stretching stress to the partially oriented and crystallized web in the direction of movement thereof; and

heating the web by noncontacting second heating means after application of the second stretching stress to a second stretching temperature substantially greater than 10°C. above the glass transition temperature to orient the web; and

wherein the web of polyethylene terephthalate film is first stretched to between 1.5 and 4.0 times its initial dimension in the direction of movement at a stretching temperature from 80° C. to 90° C., and is then stretched in the same direction to a total up to 7.0 times at a temperature between 150° C. and just below the crystal melting point of the web.

REISSUES

MAY 8, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

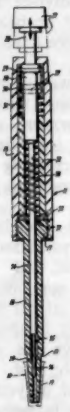
27,637
PIPETTING SYSTEM

William J. Roach, 187 Shooting Star Isle, Foster City, Calif. 94404

Original No. 3,494,201, dated Feb. 10, 1970, Ser. No. 753,268, Aug. 16, 1968. Application for reissue Sept. 7, 1971, Ser. No. 178,515

Int. Cl. B01l *3/02*

U.S. Cl. 73—425.6 18 Claims



A hollow cylindrical body has an apertured lower end portion for frictionally attaching removable tips. A movable piston, within the body, extends into the lower end portion. A collar is fixed to the upper portion of the piston and moves within a calibrating cup. The calibrating cup also moves within the body. Depressing a knob attached to the upper end of the piston will overcome the tension in a primary spring, which is interposed between a portion of the piston and the body, until the calibrating collar strikes the bottom of the calibrating cup constituting the calibration movement of the piston. An over-shoot of travel by the piston may be accomplished by further depressing the knob against the action of a relatively stiff secondary spring interposed between the bottom of the cup and the body.

27,638
ALTERNATOR RECTIFIER AND VOLTAGE REGULATOR

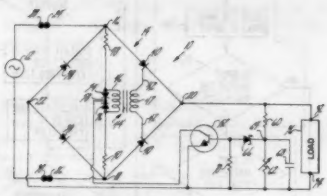
Michael J. Piteo, Enfield, Conn., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Original No. 3,439,253, dated Apr. 15, 1969, Ser. No. 628,679, Apr. 5, 1967. Application for reissue Mar. 15, 1971, Ser. No. 124,121

Int. Cl. H02m *7/20*

U.S. Cl. 321—18 5 Claims

A voltage regulator-rectifier for producing a regulated voltage direct current output from an alternator includes a bridge rectifier having two arms containing diodes and two other arms containing silicon controlled rectifiers. The two silicon controlled rectifiers are switched between non-conducting and conducting states in accordance with the value of the rectifier output voltage by a gate control circuit utilizing a transformer having its secondary winding connected at its opposite ends to the gate terminals of both of the silicon controlled rectifiers so that a forward gate current applied to one silicon controlled rectifier results in a reverse gate current applied to the other. The primary winding of the transformer is connected across the rectifier input terminals and a shunt circuit controlled by the output voltage controls the conduction through the primary winding.



27,639
MOVING BED PROCESS USING SIEVE CATALYST TO MAKE XYLENES BY TOLUENE DISPROPORTIONATION AND TRANSALKYLATION WITH C_9–C_{10} ALKYLBENZENES

Owen H. Thomas, South Holland, Thomas A. Beck, Park Forest, and Robert F. Wickman, Dolton, Ill., assignors to Atlantic Richfield Co., New York, N.Y.

No Drawing. Original No. 3,551,509, dated Dec. 29, 1970, Ser. No. 798,185, Feb. 10, 1969, which is a continuation-in-part of Ser. No. 747,840, July 26, 1968. Application for reissue Nov. 16, 1971, Ser. No. 199,338

Int. Cl. C07c *3/62*

U.S. Cl. 260—672 T 12 Claims

There is disclosed a process for catalytically disproportionating toluene to benzene and xylenes. The toluene is disproportionated over a rare-earth and hydrogen-exchanged crystalline aluminosilicate catalyst at about atmospheric pressure and a temperature of about 700 to 1100° F. Methylaromatics of 9 to 10 carbon atoms and 1 to 4 methyl groups may also be introduced into the reaction zone to increase the xylene/benzene ratio in the product.

27,640
INFLATABLE FLOAT BOOM

Campbell F. Logan, 530 Goodwin St., Jacksonville, Fla. 32204

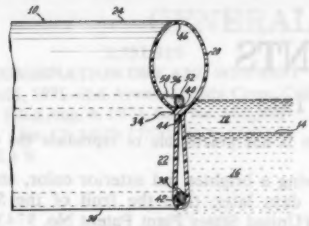
Original No. 3,494,132, dated Feb. 10, 1970, Ser. No. 757,849, Sept. 6, 1968. Application for reissue Sept. 25, 1970, Ser. No. 75,556

Int. Cl. E02b *15/04*

U.S. Cl. 61—1 F 17 Claims

An inflatable float boom having a pair of elongated selectively inflatable tubes connected throughout their lengths by a joining web and a pair of elongated hollow members filled with particulate solids are disposed within respective tubes, such members being free to fall into the lower side portions of respective tubes. A separate gas valve is connected to each tube so that one tube can be inflated to float the boom on the surface of the liquid

and the deflated tube functioning as a depending skirt therefore. A sleeve is provided between the end portions



of the tubes to bridge the gap and to surround the releasable connectors therebetween.

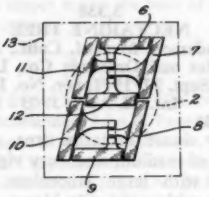
27,641
DIGITAL READOUT DEVICE WITH LIGHT GUIDES

Gerald Raymond Hosker, London, Ontario, Canada, assignor to American Gage and Machine Co., Chicago, Ill.

Original No. 3,467,960, dated Sept. 16, 1969, Ser. No. 519,596, Jan. 10, 1966. Application for reissue Dec. 1, 1971, Ser. No. 203,920

Int. Cl. G08b *5/36*

U.S. Cl. 340—378 R **7 Claims**



A digital readout device associated with a condition responsive apparatus wherein a plurality of light guides define rectangular outer faces and are arranged in the configuration of the numeral 8 and are separated so that different numbers can be displayed depending upon which of the light guides are illuminated. A source of light is provided for the light guides, and a shutter is interposed between the light source and the opposite ends of the light guides. Apertures are defined by the shutter, and the shutter is connected to the condition responsive device so that movements imparted to the shutter will change the position of the apertures whereby different ones of the light guides will be illuminated.

27,642
HIGH TRACTION VEHICLE

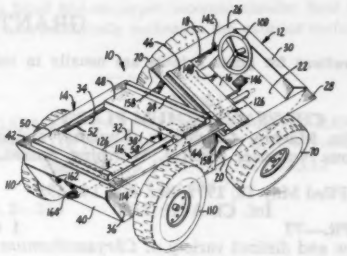
Carl E. Enos, Chico, Calif., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Original No. 3,426,720, dated Feb. 11, 1969, Ser. No. 585,640, Oct. 10, 1966. Application for reissue May 18, 1970, Ser. No. 38,285

Int. Cl. B60f *3/00*

U.S. Cl. 115—1 R **8 Claims**

An amphibious vehicle comprised of a pair of hull-like body sections coupled together in longitudinally aligned end-to-end relationship for pivotal movement relative to each other about a longitudinal extending axis. Each section is provided with a pair of drive wheels driven by an axle extending transversely through and within the confines of the section. Power is supplied to the axles by a drive shaft extending longitudinally through and between the sections in substantially coaxial relationship with the longitudinally extending axis about which the sections are adapted to pivot relative to each other. The drive shaft is driven by an engine mounted in one of the sections.



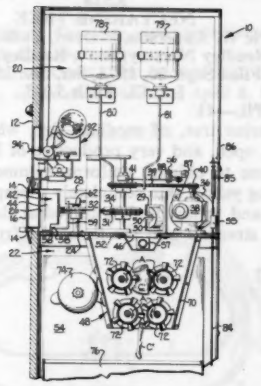
27,643
PROCESS AND APPARATUS FOR COLLECTION OF METAL CONTAINERS

Joseph D. Myers, P.O. Box 384, Hickory, N.C. 28601

Original No. 3,412,837, dated Nov. 26, 1968, Ser. No. 655,789, July 25, 1967. Application for reissue Aug. 10, 1969, Ser. No. 62,535

Int. Cl. G07f *1/06*

U.S. Cl. 194—4 C **15 Claims**



A process and apparatus for collecting and storing used metallic containers and automatically dispensing tokens for containers collected, wherein a plurality of collected containers are moved along a generally horizontal trackway, nonmagnetic containers therein gravitationally separated from the trackway, crushed, and stored while a token is automatically dispensed for each nonmagnetic metallic container stored, and wherein magnetic containers remaining on the trackway are thereafter separately stored in a suitable receptacle of the apparatus.

PLANT PATENTS

GRANTED MAY 8, 1973

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,326
CHRYSANTHEMUM PLANT

Barrie John Machin, Chichester, England, assignor to Framptons Nurseries Limited, Worthing, Sussex, England

Filed May 18, 1971, Ser. No. 144,695
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous plant of strong, upright habit, with 8–16 pale flowers per main stem, said flowers having an average of 200–250 double petals, said plant having a response time of nine weeks and tolerating a night temperature of 55–60° F. without loss of ability to initiate and develop flowers or pinking of florets.

3,327
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Sept. 3, 1971, Ser. No. 177,885
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the parent cultivar Tally Ho by its light bronze color.

3,328
NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc ., Reedley, Calif.

Filed Sept. 30, 1971, Ser. No. 185,456
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—41 **1 Claim**

A nectarine tree, of medium size, which is vigorous, spreading, open, and very productive of large to medium size, globose to oblong, uniform, symmetrical, freestone fruit having yellow skin completely overspread with red at maturity, and yellow flesh with red at the surface of the pit cavity streaked into the flesh; the fruit being slightly larger, having a brighter red exterior color, and ripening about ten days later, than the fruit of the Sun Grand nectarine (United States Plant Patent No. 974).

3,329
NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Arthur Bright, Le Grand, Calif.

Filed Sept. 29, 1971, Ser. No. 184,968
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—41 **1 Claim**

A nectarine tree, of genetic dwarf type, which is of medium size with a mature height of five to eight feet, medium vigorous, spreading, dense, and productive of large to medium size uniformly globose freestone fruit having yellow skin substantially overspread with red and yellow flesh, the surface of the pit cavity being red, and the stone being brown; the fruit averaging somewhat larger than, and being in harvest over a month before, the Golden Prolific nectarine (United States Plant Patent No. 2,193), and in harvest approximately with the Red Haven peach (unpatented).

3,330
NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Stark Bro's Nurseries and Orchards Co., Louisiana, Mo.

Filed Sept. 27, 1971, Ser. No. 184,060
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—41 **1 Claim**

A genetically dwarf nectarine tree, with short internodes, which is of medium size, very vigorous, spreading, dense, foliated with large lanceolate, acutely pointed leaves, flowered with self-fertile bloom, and is a regular and very productive bearer of uniform, symmetrical, medium size, globose fruit having yellow skin substantially overspread with red, and firm, crisp, yellow flesh with red at the surface of the pit cavity; the fruit—which is glossy—ripening about a month earlier than the Golden Prolific (United States Plant Patent No. 2,193), being clingstone instead of freestone, and having globose instead of reniform glands.

PATENTS

GRANTED MAY 8, 1973

GENERAL AND MECHANICAL

3,731,319

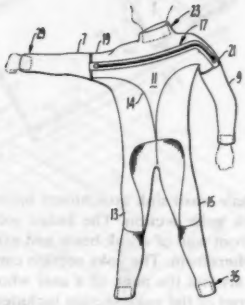
COMBINATION DRY AND WET SUIT

Jack E. O'Neill, 1071-41st Avenue, Santa Cruz, Calif.

Filed Aug. 4, 1971, Ser. No. 168,988

Int. Cl. A62b *17/00*; B63c *11/04*

U.S. Cl. 2—2.1 R **4 Claims**



A suit for surfing, diving, sailing, marine survival and the like is provided wherein the suit is provided with tight inturned seals at the neck, ankles, and wrists so that it is substantially water tight. An inflater valve is provided so that buoyancy can be given to the suit if this is desired. The suit is made in one piece with a single zipper across the back of the shoulders extending from arm to arm.

3,731,320

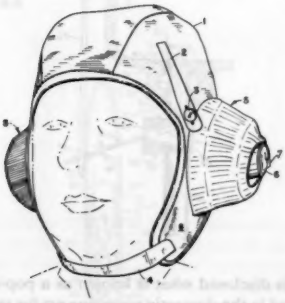
EAR DEVICE ADAPTIVE LINER

Robert F. White, Sturbridge; John F. Tavares, Dudley, both of Mass., and Bernard M. Gann, Baltimore, Md., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 23, 1971, Ser. No. 211,186

Int. Cl. A42b *1/04*

U.S. Cl. 2—205 **6 Claims**



A liner type cap for use with ear operative devices. A support member is adapted to closely fit the wearer's head and has depending ear portions. The ear portions contain apertures which register with the ear operative device. A substantially tubular resilient band has one end circumferentially attached to the periphery of the ear portion aperture. When the liner is worn with the ear operative device, this tubular resilient band has an upper internal annular face which fits around and frictionally embraces the exterior surfaces of the device.

3,731,321

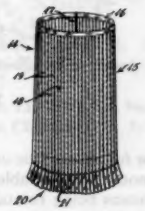
GARMENT HAVING PLEATED APPEARANCE

Flora Dyche, 310 West End Avenue, 17 B, New York, N.Y.

Filed Dec. 15, 1971, Ser. No. 208,221

Int. Cl. A41d *1/14*

U.S. Cl. 2—211 **2 Claims**



Apparatus including wearing apparel which imparts the illusion of a fully pleated garment, such as a dress or skirt, in which only a small portion of the garment has the flexibility of pleats.

3,731,322

IMPLANTABLE ARTIFICIAL HEART WITH EXTERNALLY WORN FLUID PRESSURE ENERGY TRANSMITTER

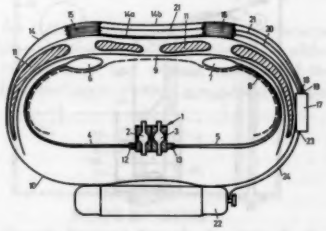
Heinz Kresse, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Jan. 8, 1971, Ser. No. 104,857

Claims priority, application Germany, April 8, 1970, P 20 16 651.2

Int. Cl. A61f *1/24*

U.S. Cl. 3—1 **1 Claim**



An artificial heart has an implanted pneumatic or hydraulic blood pump as well as an also implanted energy receiver serving as a source of energy for the blood pump, energy being transmitted from the outside through the undamaged skin of the patient. The invention is particularly characterized by the provision of at least one compressible elastic bag serving as

the energy receiver, filled with liquid or gas, connected with the blood pump and preferably implanted between the peritoneum and the fascia transversalis; it is subjected to pressure change acting from the outside.

3,731,323

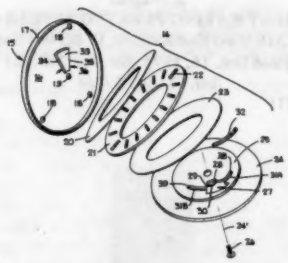
ORTHOTIC-PROSTHETIC TRANSVERSE ROTATOR

John J. Glancy, 6280 Dean Road, Indianapolis, Ind.

Filed Aug. 26, 1971, Ser. No. 175,254

Int. Cl. A61f *1/08, 5/00*

U.S. Cl. 3—2 **10 Claims**



A transverse rotator for an orthotic and/or prosthetic limb. The rotator has a mount connectable to the limb with a ground engageable means being rotatably connected to the mount. A projection and a first and second stop are provided in the rotator to limit the rotation of the ground engageable means with respect to the mount. Means bearingly space the mount and ground engageable means apart. A spring is provided to return the ground engageable means to the normal position. The amount of rotation of the ground engageable means may be varied. A pair of racer plates are positioned on either side of the means which bearingly space the mount and ground engageable means apart.

3,731,324

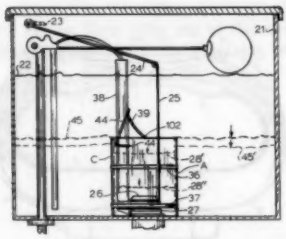
WATER SAVING APPARATUS FOR WATER CLOSETS

Jacob R. Moon, Hillsborough, N.C., assignor to Moon Water Saver, Inc., Hillsborough, N.C.

Filed Jan. 8, 1971, Ser. No. 105,032

Int. Cl. E03d *1/20, 1/22, 1/30*

U.S. Cl. 4—18 **3 Claims**



The amount of water used for bowl evacuation of a water closet is substantially reduced by an apparatus and method dependent on modifying the water tank construction above and around the valve seat either in its original design or by employment of an auxiliary structure whereby the water employed for evacuation and bowl washing is caused to collect as a rather shallow depth rectangular body of water rather than as the usual relatively deep rectangular body of water inherent to the conventional deep, rectangular water tank but without substantially affecting the normal velocity or quality of flow.

3,731,325

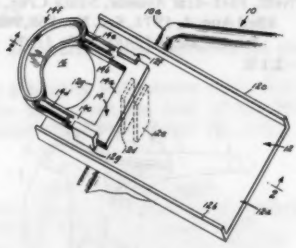
PORTABLE HAIR WASH SINK ATTACHMENT

Joseph S. Guarrasi, 39 Buckingham Road, Brooklyn, N.Y.

Filed April 21, 1971, Ser. No. 136,025

Int. Cl. A47k *3/12*; **A61h** *35/00*

U.S. Cl. 4—159 **9 Claims**



A portable hair wash sink attachment having a board section and a neck yoke section. The board section can be attached to the front wall of a sink basin and extends outwardly and upwardly therefrom. The yoke section can slide along the board and fits around the neck of a user whose hair is being washed. The front of the yoke section includes a dish which is placed under the chin of the user so that any drainage which does not fall directly on the board is collected in the dish, channels being provided for allowing the drainage collected by the dish to flow to the board, and then down the board and into the sink.

3,731,326

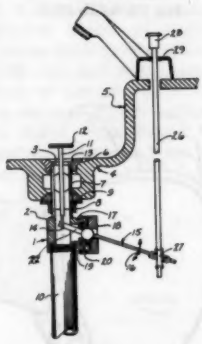
POP-UP BALL ROD CONSTRUCTION

William E. Politz, Delphi, Ind., assignor to Stephen A. Young, Monticello, Ind.

Filed June 25, 1971, Ser. No. 156,849

Int. Cl. E03c *1/22*

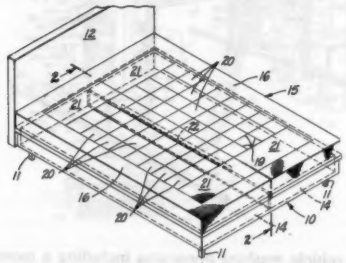
U.S. Cl. 4—203 **5 Claims**



There is disclosed what is known as a pop-up fitting, commonly used in the domestic plumbing art for regulation of outflow from lavatories or similar fixtures, in this case the pop-up including certain usual elements to mount the same in the drain outlet of such a fixture, and including a plunger member which is operable to regulate flow through the seat portion of said member, one of the problems solved hereby being the relatively corrosive effects of soapy water used in the lavatory and having a detrimental effect upon the operating means known as the ball rod of such a pop-up by reason of build-up of chemical materials and other types of material which would adversely affect the construction by corroding the ball rod in

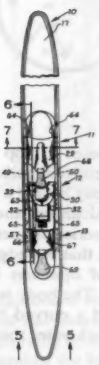
such a manner as to make the same inoperable, the concept herein residing in the enclosing of the portion of the operating device in the water passage by a material not affected by corrosive elements, and at the same time having the necessary lubricating qualities to facilitate easy operation.

3,731,327
BED CONSTRUCTION
Louis Elliott Frey, 1271 East Sixth Street, Los Angeles, Calif.
Filed Aug. 6, 1971, Ser. No. 169,651
Int. Cl. A47c *23/00*
U.S. Cl. 5—345 **7 Claims**



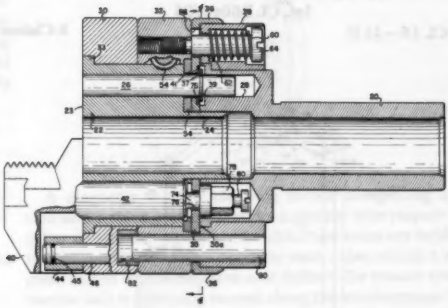
A bed construction comprising a unitary frame member within which are removably mounted a pair of separate box spring units. A mattress mounted on the spring units is provided with a slit along its longitudinal axis which is aligned with the dividing line between the spring units. The bed appears to be unitary, but functions like a pair of separate beds, with each half being responsive to the body weight and movements of its occupant without affecting the other half or its occupant. A foldable frame member is provided for a king size bed.

3,731,328
WATER SKI WITH VENTURI CHANNEL AND MEANS FOR SECURING FOOT RETAINERS
George E. Russell, 2708 Taylor Road, Columbus, Ind.
Filed June 7, 1971, Ser. No. 150,389
Int. Cl. A63c *15/06*
U.S. Cl. 9—310 AA **6 Claims**



A water ski having a venturi channel formed on its bottom surface with means for securing foot retainers provided on its top surface. A converging venturi channel extending approximately two-thirds the length of the ski is formed on the bottom surface of the ski. A rib integrally attached to the bottom of the ski extends through the venturi channel and is positioned in the center of the channel. A rudder attached to the bottom of the ski is also positioned in the center of the channel. The top surface of the ski is depressed forming two pairs of channels. The front foot retainer has beaded edges along the sides and length of the foot retainer which extend into one pair of the channels being secured therein by plates. An adjustable cup assembly is slidable within the channels and is lockable to the top surface of the ski. A back foot retainer has beaded edges extending along the sides and length of the foot retainer which extend into the second pair of channels being secured therein by plates. Non-skid surfaces are integrally formed in the top surface of the channel for receiving the skier's feet.

3,731,329
DIE HEAD
Donald E. Youtz, and Edwin M. Eigenbrode, both of Waynesboro, Pa., assignors to Teledyne, Inc., Los Angeles, Calif.
Filed Dec. 11, 1970, Ser. No. 97,065
Int. Cl. B23g *1/28, 5/10*
U.S. Cl. 10—121 **1 Claim**

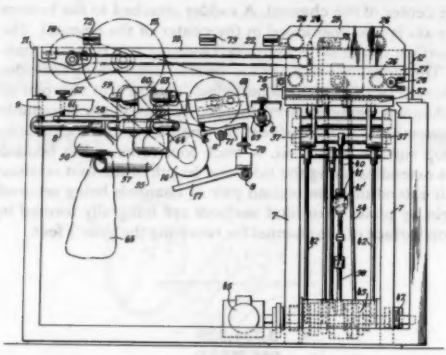


A die head for cutting threads on a workpiece incorporating means permitting replacement of the cutting tools without disassembly of the die head and without removal of the head from the machine tool upon which it is mounted for operation.

3,731,330
BOOK BINDING
Lionel John Bryant Rushent French, London, England, assignor to The Sulby Engineering Development Company Limited, London, England
Filed Feb. 25, 1971, Ser. No. 118,672
Int. Cl. B42c *19/00*
U.S. Cl. 11—1 AD **7 Claims**

A bookbinding machine in accordance with the invention comprises a device for applying a cover to a book back, a device for preparing the back by cutting or abrading, and a device for applying adhesive to the prepared book back. These three devices are arranged in a straight line and are so disposed that a book commences its outwardly travel from the

cover-applying device passes over the adhesive-applying device which is rendered inoperative. The book returns from



the preparing device and over the operative adhesive-applying device. The cover is then applied.

3,731,331

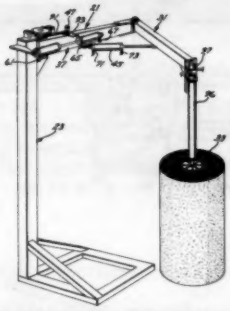
HIGH SPEED OVERHEAD CAR WASH APPARATUS

David M. Haley, Glendale, and Richard P. Bergantzel, Granada Hills, both of Calif., assignors to Allen Electric and Equipment Company, Melville, Long Island, N.Y.

Filed Jan. 19, 1972, Ser. No. 218,997

Int. Cl. B60s *3/06*

U.S. Cl. 15—21 D **8 Claims**



High speed overhead car wash apparatus including an overhead primary arm supported on one end from a support structure disposed on one side of the path of a car to be washed and normally projecting transversely over such car path. A secondary arm is pivotally supported on one end from the free extremity of the primary arm and normally projects rearwardly along such car path and angles to such one side thereof. A rotary brush is suspended from the free end of the secondary arm and is normally disposed centrally in the car path. Drive means is provided for rotating the brush and control means is connected with the arms and is responsive to engagement of the brush by the front of the car to fold the secondary arm on the primary arm and move the brush to such one side of the car path and to then then move the primary arm rearwardly along such car path and is further responsive to such brush clearing the rear corner of the car to move such primary arm forwardly as the secondary arm unfolds to thereby carry such brush forwardly and inwardly across the rear of the car and to continue forward movement of the primary arm beyond its normal position to wash at least one half f the rear of such car.

3,731,332

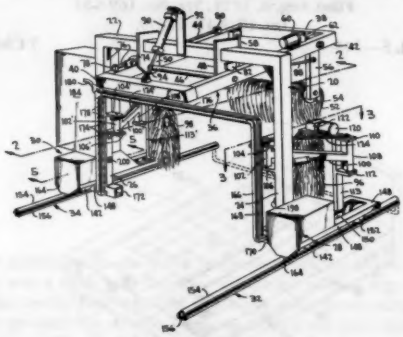
AUTOMATIC CAR WASH APPARATUS

Robert P. Bernardi, Dauphin County, Pa., assignor to Bernardi Brothers, Inc., Harrisburg, Pa.

Filed Sept. 11, 1969, Ser. No. 857,027

Int. Cl. B60s *3/06*

U.S. Cl. 15—21 E **14 Claims**



Automatic vehicle washing apparatus including a movable frame adapted to pass over a vehicle to be washed, a pair of side brushes and a top brush disposed on the frame to wash the vehicle as the frame passes over the vehicle a first time and to rinse the vehicle as the frame passes over the vehicle a second time, each side brush being arranged to wash more than half of the front end and rear end of the vehicle, and control means for controlling the sequence of operation of the apparatus with respect to the position of the frame relative to the vehicle.

3,731,333

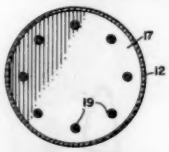
MOP HOLDER

William T. Davis, 1834 Columbia Rd. N.W., Washington, D.C.

Filed July 15, 1971, Ser. No. 162,940

Int. Cl. A47l *13/51*

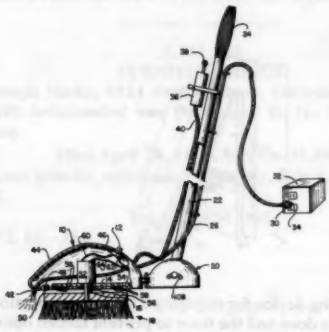
U.S. Cl. 15—257 **4 Claims**



This specification discloses a mop holder which may be readily made from a conventional garbage can and its lid. The holder comprises a can body having a slight taper, a dolly on which the body is mounted, an intermediate partition or shelf in the body and having a series of apertures therein and a lid having a peripheral flange that is wedged into the open top of the body and a series of openings in alignment with the openings in the partition. The body is formed with an outlet just above its bottom and a curved baffle is positioned opposite to the outlet to direct water thereto. The outlet is controlled by a pet cock.

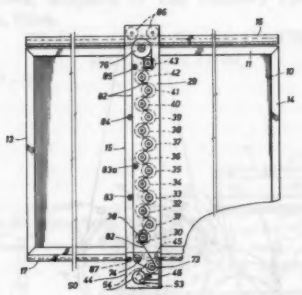
The present invention relates to mop holders and is concerned primarily with a mop holder which supports mops in vertical positions with the mop heads uppermost and which accommodates water that drains from the mop heads.

3,731,334
BATHTUB SCRUBBER
Marlene Carbonell, 300 Knowles Avenue, Apt. 302, Winter Park, Fla.
Filed June 11, 1971, Ser. No. 152,175
Int. Cl. A47l *11/283*
U.S. Cl. 15—50 R 7 Claims



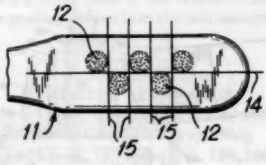
A bathtub or sink scrubber is provided with an electric motor for rotating a brush or other polishing member. The motor is contained within a first dome-like housing and supported by a rigid support member. A second dome-like housing is provided in movable relation to the first dome-like housing and the second housing has a handle member extending therefrom which is adjustable about an axis within the second housing permitting the bathtub scrubber to be universally positioned in relation to the handle.

3,731,335
AUTOMATIC CHALKBOARD ERASING APPARATUS
Billie R. Chrisp, Rt. 1 Box 199-F, Magnolia, Tex.
Filed July 7, 1971, Ser. No. 160,402
Int. Cl. B43l *21/00*
U.S. Cl. 15—97 R 2 Claims



An automatic chalkboard eraser consists of a body which spans the board and has bearings running along the top and bottom thereof, a plurality of erasers rotatably mounted in the body and bearing against the board, an electric motor carried by the body, and drive means connecting the motor, the erasers, and traverse means. Manual and automatic switches provide for operation of the device in either direction within limits.

3,731,336
TOOTHBRUSH
James M. Rubin, 141 West 17th Street, New York, N.Y.
Filed May 3, 1971, Ser. No. 139,471
Int. Cl. A46b *9/04*
U.S. Cl. 15—167 R 7 Claims



A toothbrush having a single row of tufts spaced along the longitudinal axis of the toothbrush so as to minimize interference between adjacent tufts as the tufts are deflected during the brushing operation.

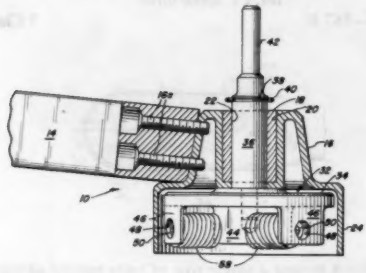
3,731,337
MAGNETIC WINDOW CLEANING DEVICE
John S. Doyel, 404 W. 20th St., New York, N.Y.
Filed Dec. 3, 1971, Ser. No. 204,515
Int. Cl. A47l *1/08*
U.S. Cl. 15—220 A 13 Claims

A magnetic window cleaning device comprising a master unit and a slave unit adapted to maintain with respect to each other an operative position in which the units are held by mutual magnetic attraction opposite each other across a windowpane and in which the slave unit follows the master unit as the master unit is manually moved along the windowpane. Each of the units comprises a rigid frame which holds an annular multipole permanent magnet and which has a flat surface facing the windowpane and a raised edge and a glide pin for spacing the flat surface from the windowpane. A cleaning pad such as a paper towel is held by a hinged pad holder over the flat surface and over the raised edge. The portion of the pad over the raised edge constitutes a primary cleaning surface and the portion of the pad which is over the flat frame surface constitutes a secondary cleaning surface, with the primary cleaning surface exerting greater pressure on the windowpane than the secondary cleaning surface. The annular magnets are magnetized in a plurality of circumferentially alternating poles and allow placing the master and slave units at different angles with respect to each other to facilitate cleaning of areas which may be difficult to reach otherwise.

3,731,338
MECHANICAL PAINT SCRAPER
Vincent T. Walsh; Erik Henningsen, both of Milwaukee, and Frederick B. Burns, South Milwaukee, all of Wis., assignors to E Z Paintr Corporation, Milwaukee, Wis.
Filed March 31, 1971, Ser. No. 129,764
Int. Cl. A47l *13/02*
U.S. Cl. 15—236 R 12 Claims

A mechanical paint remover of the type having a base and a shaft for connection to a power tool to rotate the base, charac-

terized by the provision of threaded abrading elements rotatably secured to the underside of the base for rotation about an axis which is generally parallel to the base and the



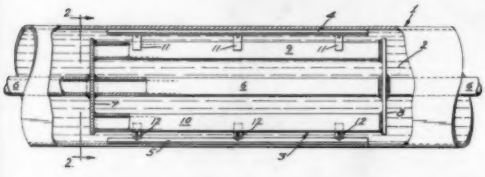
work surface with which the tool is to be used with the rotatable axis being at a slight angle relative to the axis rotation of the base.

3,731,339

SCRAPER ASSEMBLY FOR PROCESS VESSELS

Christopher D. Addison, Media, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Sept. 29, 1971, Ser. No. 184,862
Int. Cl. F28g 3/12
U.S. Cl. 15—246.5 **4 Claims**



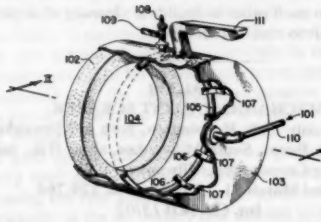
A rotating scraper blade, for use in a process vessel containing liquid, is driven by a hollow shaft whose ends are sealed off from the liquid, thereby to entrap air in the hollow interior of the shaft and provide a buoyant effect on the scraper assembly. There may be additional supports for the blade, in the form of pipes whose ends are similarly sealed off from the liquid, and secured to the driving shaft.

3,731,340

MOTOR VEHICLE BRAKE DRUM CLEANING APPARATUS

Horace R. Pitre, Sr., 144 Atkinson, Baton Rouge, La.

Filed Aug. 9, 1971, Ser. No. 170,069
Int. Cl. A47l 5/14
U.S. Cl. 15—345 **3 Claims**



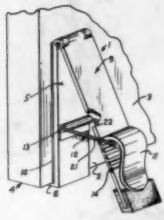
An apparatus for cleaning motor vehicle brake drum assemblies and other objects which apparatus has no moving parts and utilizes fixed air streams to being cleaned while at the same time preventing the dust and other particles from contaminating the cleaning work area.

3,731,341

DOOR BLOCKING DEVICE

Howard W. Woodruff, 7231 Sycamore, Kansas City, Mo.

Filed Oct. 26, 1971, Ser. No. 192,518
Int. Cl. E05f 5/02
U.S. Cl. 16—82 **5 Claims**



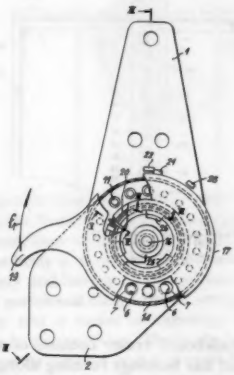
A door blocking device for engaging a lower edge portion of an inner side of a door and the floor to prevent forced opening movement of the door. The blocking device includes a bracket having portions engageable with a lower edge and a lower edge portion of the inner side of the door and a stop member hingedly connected to the bracket and adapted to incline downwardly and away from same with a floor engaging foot on the free end thereof. A latch member is connected by a link to the bracket, said latch member being selectively engaged with the stop member to hold same at selected inclination and to prevent opening movement of the door.

3,731,342

ARTICULATION FOR ADJUSTMENT OF INCLINATION OF A SEAT BACK REST ESPECIALLY FOR MOTOR VEHICLE SEATS

Maurice Claude Cousin, Orne, France, assignor to A. & M. Cousin et Cie, Etablissements Cousin Freres, Orne, France

Filed Aug. 6, 1971, Ser. No. 169,659
Claims priority, application France, Aug. 6, 1970, 7029061
Int. Cl. E05d 11/10
U.S. Cl. 16—144 **13 Claims**



Linkage for adjusting a seat back rest especially for motor vehicles characterized thereby that two bearing brackets or plates are provided on a bearing sleeve and have holes therewith in circular rows upon equal diameters, whereby the

rows of holes relative to each other provide a difference of at least one hole and whereby one of the bearing brackets or plates carries one of the bolts axially slidably guiding a disc or plate and whereby the bolts are covered by a rotatable housing which operates together with a loose pivotal disc and running-off surface with a lateral shifting. A return guidance of the bolts is effected by the running-off surfaces and loose pivotal disc and effective from each individual bolt having elastic elements provided therewith in those holes engaged by the two bearing brackets or plates which are covered in sufficient measure so that the heads of the bolts can be received thereby.

3,731,343

FURNITURE HINGE

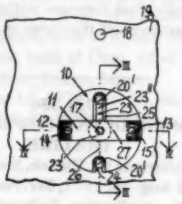
Christoph Naske, 8111 Froschhausen, Germany, assignor to WHB-Anbaumobel von Poschinger K. G., Murnau, Germany

Filed April 24, 1970, Ser. No. 31,584

Claims priority, application Germany, July 8, 1969, P 19 34 581.4

Int. Cl. E05d *3/06*

U.S. Cl. 16—163 **11 Claims**



A furniture hinge consisting of a cup-shaped fitting and an arm which is pivotably connected thereto and may be removably secured to a plate which by means of a pair of elongated apertures therein may be plugged on the headed projecting ends of a pair of pins which may be mounted in bores in a furniture wall, and the plate may then be shifted in a perpendicular direction and will thereby be wedged tightly against the furniture wall.

3,731,344

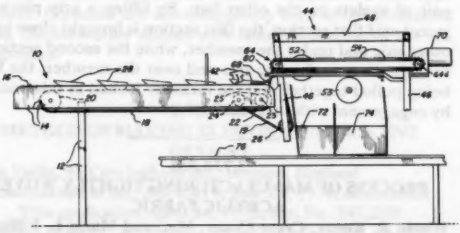
IN-FEED FOR AUTOMATIC CUT-UP SAW

Michael W. Phares, Phoenix, Ariz., and Paul E. Young, Cedar Falls, Iowa, assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Feb. 1, 1971, Ser. No. 111,470

Int. Cl. A22c *21/00*

U.S. Cl. 17—11 **7 Claims**



A poultry wing and breast saw is constructed of laterally spaced parallel longitudinally extending chain conveyors for transporting poultry past a plurality of blades employed for removing wings as well as for subdividing the bird longitudinally. Poultry is introduced into the inlet end thereof by the provision of a feed mechanism consisting of an endless feed conveyor composed of a chain provided with longitudinally spaced poultry supporting fixtures or buckets positioned to travel toward the inlet of the saw assembly. Each bucket includes side members which support the body of the bird such that the wings are in the proper position to enter the saw mechanism and a pusher plate at the rearward end thereof for transferring the poultry pieces into the saw assembly.

3,731,345

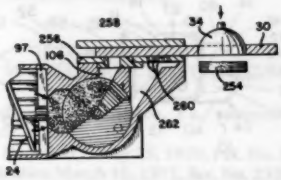
CHARGING APPARATUS

Donald Alvin Brackman, Englewood, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio

Filed Oct. 12, 1971, Ser. No. 188,146

Int. Cl. A22c *7/00*

U.S. Cl. 17—32 **12 Claims**



Apparatus for charging the cavity in the mold plate of a patty machine with a food product, such as a meat product to form hamburger patties. The charging apparatus includes a cylinder having a first opening for receiving the food product and a second opening, peripherally displaced from the first opening, through which the product is discharged from the cylinder into the mold plate cavity. A piston is rotatably mounted in the cylinder and conveys the food product from the first opening to the second as the piston rotates about the longitudinal axis of the cylinder.

3,731,346

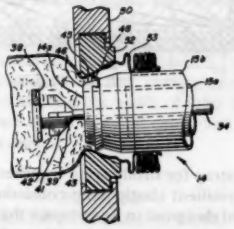
STUFFING METHOD AND APPARATUS

Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 23,934, March 30, 1970, Pat. No. 3,659,317. This application May 1, 1972, Ser. No. 248,896

Int. Cl. A22c *11/06*

U.S. Cl. 17—49 **4 Claims**



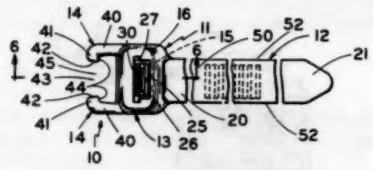
Apparatus and method are disclosed for stuffing a conglomerate meat mass into a flexible container which comprises a stuffing means, shut-off and/or severing means mounted on the outlet end of said stuffing means comprising a member mounted on the outlet end of the stuffing means and a cooperating moving member adjacent to and aligned with

said mounted member and means for advancing and retracting said cooperating moving member into and out of positive engagement with said mounted member wherein such engagement seals said outlet end of the stuffing means, severs product protruding therefrom and stops passage of product therefrom.

3,731,347
CABLE TIE

Jack Edward Caveney, Chicago; Roy A. Moody, Flossmoor, and John Jean Bulanda, New Lenox, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed March 16, 1971, Ser. No. 124,724
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **9 Claims**

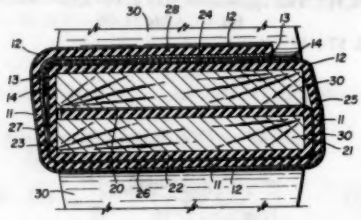


A cable tie and several embodiments thereof are disclosed herein and include generally an elongated strap having a retaining head and a tongue portion. The retaining head is provided with first and second strap receiving means to respectively retain the strap in a looped condition and to position the tongue end portion of the strap adjacent the looped portion thereof.

3,731,348
SKI TYING STRAP

Wolfgang Luehne, 1760 E. 114th Place, North Glen, Colo.

Filed March 16, 1972, Ser. No. 235,199
Int. Cl. B65d *63/00*
U.S. Cl. 24—16 PB **4 Claims**

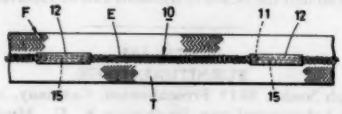


A ski tying strap for firmly tying together the skis of a pair, comprising a resilient elastic strap consisting of a spacer portion at one end designed to lie between the facing surfaces of skis of a pair, and a wrap-around portion which extends nearly twice around the non-facing surfaces of a pair of skis when the strap is stretched longitudinally. The wrap-around portion of the strap is provided with "Velcro" type fastening means applied to one side near one end of the strap and second fastening means applied to the opposite side intermediate the first fastening means and the spacer portion. The strap is made of two layers, one of which is foam rubber and the other nylon bonded to the rubber layer.

3,731,349
ZIP FASTENER CHAIN

Fumio Terada, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed March 29, 1972, Ser. No. 239,140
Claims priority, application Japan, April 5, 1971, 46/25118
Int. Cl. A44b *19/12*
U.S. Cl. 24—205 R **2 Claims**



A zip fastener chain comprised of a pair of stringer tapes of substantially endless length each having along their longitudinal edges alternate groups of fastener elements and element-free selvage portions. The groups of fastener elements are interconnected by a strip of water-soluble film, the arrangement being such that there may be provided a space or element-free portion on an individual fastener without having to remove those fastener elements off the tapes as in conventional practice.

3,731,350
LACE TENSIONING DEVICE FOR SHOES, BOOTS AND THE LIKE

Fritz Diebold, Asylstrasse 92, Zurich, Switzerland

Filed Aug. 18, 1971, Ser. No. 172,859
Claims priority, application Switzerland, Aug. 19, 1970, 12441/70
Int. Cl. A43b *11/00*
U.S. Cl. 24—140 **9 Claims**

A device for tensioning a lace joining pairs of eyelets on facing flaps of a shoe comprises a member which, in the loose position, passes under a first section of lace joining a pair of eyelets on one flap and over a second section of lace joining a pair of eyelets on the other flap. By lifting a grip piece adjacent said first section, the first section is brought close to the other side and under the member, while the second section is brought close to the one side and over the member, the flaps being pulled together and the member locked in this position by engagement with said one flap.

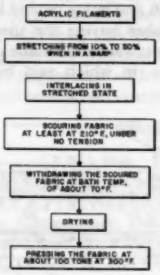
3,731,351
PROCESS OF MANUFACTURING TIGHTLY WOVEN ACRYLIC FABRIC

Witold R. Kocay, Creve Couer, Mo., and Mario L. Fillippeli, Jr., Athens, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 12, 1970, Ser. No. 80,167
Int. Cl. D06c *27/00, 29/00*
U.S. Cl. 28—76 R **5 Claims**

The invention relates to a method using polyacrylonitrile filaments having a tensile strength less than 50,000 psi and an

elongation between 20 and 50 percent for weaving a fabric structure having a very restricted network of interstitial


ACRYLIC FILAMENTS
STRETCHING FROM 10% TO 50% WHEN IN A WARP
INTERLACING IN STRETCHED STATE
SCOURING FABRIC AT LEAST AT 210° F. UNDER NO TENSION
WITHDRAWING THE SCOURED FABRIC AT BATH TEMP. OF ABOUT 70°F.
DRYING
PRESSING THE FABRIC AT ABOUT 100 TONS AT 300°F.

openings of such a nature that there is a marked resistance to the passage of solar radiation and particles in a fine state of subdivision.

3,731,352

METHOD OF MANUFACTURING A FIBROUS SHEET

Miyoshi Okamoto, Osaka; Koji Watanabe, Otsu; Keiichi Ashida; Toyohiko Hikota, both of Kyoto; Shungi Mizuguchi, and Makoto Kounosu, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed June 15, 1970, Ser. No. 46,410

Int. Cl. D04h *18/00*

U.S. Cl. 28—72.2 R **13 Claims**

A method of manufacturing a fibrous sheet including an application of a locational cutting operation to one or more superimposed fibrous webby masses at a stage preceding the usual needle punching operation thereon and a fibrous sheet manufactured thereby having an internal configuration wherein numerous fine fibers are three-dimensionally entangled with each other. The known islands-in-a-sea type synthetic filaments are advantageously used in the formation of the fibrous webby masses with later elimination of the sea component.

3,731,353

METHOD OF MAKING ELECTROLUMINESCENT DEVICES

Aron Vecht, 95 Corringham Rd., London, England

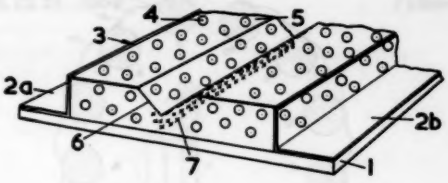
Continuation of Ser. No. 6,419, Jan. 28, 1970, abandoned. This application April 24, 1972, Ser. No. 247,218

Claims priority, application Great Britain, Feb. 16, 1972, 4,566/72

Int. Cl. H01j *9/00*

U.S. Cl. 29—25.13 **9 Claims**

pg,1 A process for making an electroluminescent device comprising a particle-bearing matrix of phosphor particles in a transparent binder wherein the particles are a compound of an element of Group IIb and an element of the group consisting of sulphur and selenium with an admixture of an activator and a coating of a Group Ib element. A layer of particle-bearing matrix is arranged between two electrodes and a direct current is passed therethrough until a high electrical resistance has been formed in a predetermined region of the layer, whereby in subsequent service the predetermined region produces a high electroluminescence.



3,731,354

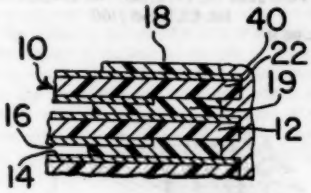
METHOD OF MAKING A MULTILAYER PLASTIC CHIP CAPACITOR

Charles C. Rayburn, Falls Church, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 40,012, May 25, 1970, Pat. No. 3,654,532. This application March 10, 1972, Ser. No. 233,825

Int. Cl. H01g *13/00*

U.S. Cl. 29—25.42 **13 Claims**



Multilayer chip capacitors and method of making whereby two-side metalized plastic strip material is wound in annular hoop form and opposite sides of hoop are pressed together to bond layers together. The metalized plastic strip is pre-coated with a very thin coating of a heat sealable material such as plastic which functions as a capacitor dielectric and also as a bonding agent. The marginal edges of the pressed hoop are sprayed with molten aluminum at high velocity which makes contact with the edges of the thin metalized layers and penetrates the plastic coating to also provide contact with marginal portions of the metalized electrode coatings. The flattened hoop is then sliced into a plurality of capacitors which can be made to have any value desired over a large range by cutting them to a particular width. Values can be controlled very precisely by first cutting and testing one capacitor and then altering the width of later cut capacitors relative to the tested one. The uncut capacitors can be stored and cut to value as needed.

3,731,355

ROLLER BURNISHING TOOL

Heinz H. Rottleuthner, Neu Isenburg, Germany, assignor to Amtel, Inc., Providence, R.I.

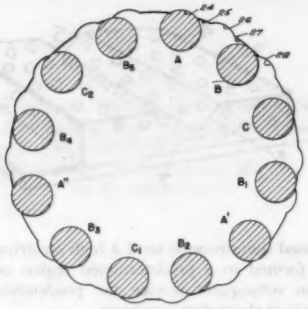
Continuation-in-part of Ser. No. 21,807, March 23, 1970. This application Sept. 27, 1971, Ser. No. 183,982

Int. Cl. B24b *39/00*

U.S. Cl. 29—90 **12 Claims**

A roller burnishing tool having a series of processing rolls mounted in a cage which rolls are actuated radially outward or

radially inward as the case might be, the rollers operating against a work piece. The mandrel is constructed in a fashion whereby it not only creates a surface against which the rollers



are pressed but is also fashioned to periodically force the rollers against the surface to be processed so as to peen the surface and also to press against the surface during another part of their rotation about the mandrel.

3,731,356

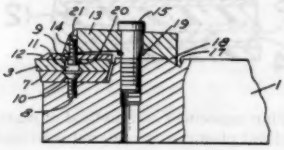
CUTTING TOOL

Thomas W. Gowanlock, Rochester, Mich., assignor to General Electric Company, New York, N.Y.

Filed June 18, 1971, Ser. No. 154,551

Int. Cl. B26d *1/00*

U.S. Cl. 29—96 R **2 Claims**



A cutting tool of the type having a recess or pocket at one axial end thereof in which a disposable cemented carbide cutting insert is held by an overhead clamp which also acts to pull the insert back into the pocket. A separate chip breaker plate is releasably attached to the clamp. The means for attachment of the chip breaker plate to the clamp extends through the chip breaker to the clamp and contains a projection below the chip breaker plate which fits within the hole in the insert, so that tightening of the clamp pulls the insert simultaneously toward the shoulder and the base of the recess to firmly clamp the insert in the recess of the shank.

3,731,357

APPARATUS FOR ADJUSTING THE ALTITUDE OF THE CHORD OF AN EXPANDING ROLL

Masayuki Shirai, Osaka, Japan, assignor to Yamauchi Rubber Indsutry Co., Ltd., Osaka, Japan

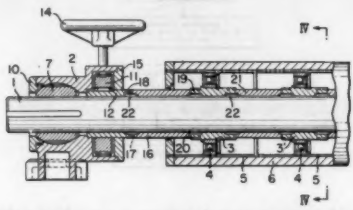
Filed June 16, 1971, Ser. No. 153,519

Claims priority, application Japan, June 15, 1970, 45/55524

Int. Cl. B21b *13/02*

U.S. Cl. 29—116 AD **5 Claims**

An apparatus for adjusting the altitude of the chord of an expanding roll characterized in comprising; a central shaft bent in an arc-shape with the amount of its radial deflection increasing progressively toward the middle thereof from an imaginary straight line corresponding to the axis of an unbent central shaft; a plurality of eccentric discs or bushes rotatably fitted around said shaft and being spaced lengthwise along the axis thereof, said bushes having the their eccentricities increasing progressively toward the middle of said central shaft; a plurality of sleeves, in which said bushes are rotatably



disposed respectively; a rubber roll covering said sleeves and integrated therewith to form a single rotatably unit; a plurality of tubular coupling members rotatably fitted around said central shaft between said bushes and coupling with adjacent bushes; rotating means fixedly disposed on an outwardly extending portion of the central shaft for the purpose of rotating said tubular coupling members; and a bearing journaling said central shaft so as to keep said central shaft fixed thereto and, in case of need, to permit said shaft to turn round therein.

3,731,358

ROLL FOR PRESSURE FUSING TONER AT ELEVATED TEMPERATURES

Kenneth M. Artl, Williamson, N.Y., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed May 20, 1971, Ser. No. 145,563

Int. Cl. B21b *31/08*

U.S. Cl. 29—132 **2 Claims**

A silicone rubber roll for pressure fusing of electrostatically produced and toned images at elevated temperatures. The roll inherently prevents offset of the image by supplying a release material to the surface of the roll. When the release material is depleted the roll can be restored by impregnation with silicone oil.

3,731,359

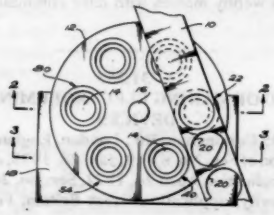
APPARATUS AND PROCESS FOR MAKING HOLLOW BALL BEARINGS

Edward R. Glenn, 2300 Laurel Place, Newport Beach, Calif.

Division of Ser. No. 23,218, March 27, 1970, Pat. No. 3,660,880. This application Feb. 24, 1972, Ser. No. 229,111

Int. Cl. B23p *11/00, 19/04;* **B21d** *39/02*

U.S. Cl. 29—148.4 B **15 Claims**



The apparatus and process for making hollow ball bearings which comprises means to stamp round metal blanks from flat

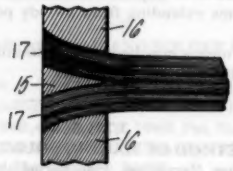
metal stock, stamping round metal blanks, forming means to form the blanks, drawing and forging the blanks to establish pairs of concavo-convex hemispheres, spaced relatively shiftable welding electrodes with hemisphere receiving welding seat, arranging the pairs of hemispheres between two electrode welding seats with their concaved surfaces in opposed relationship, urging the rim portions of the opposed hemispheres into pressure engagement with each other and welding them together to form hollow ball bearings.

3,731,360

METHOD OF MAKING A COMPOSITE BLADE WITH AN INTEGRALLY ATTACHED ROOT THEREON

Hilton F. Stone, Jr., Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed April 7, 1971, Ser. No. 131,967
Int. Cl. B23p *15/04*; B21k *3/04*
U.S. Cl. 29—156.8 B **8 Claims**



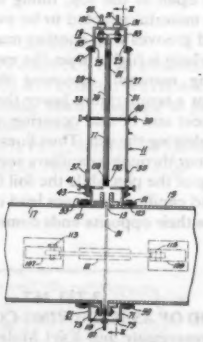
A method of making a composite blade with an integral root thereon in a single compacting and bonding operation thereby to assure a secure attachment of the blocks to the fiber layers and the fiber layers together.

3,731,361

APPARATUS FOR INSTALLING IN OR REMOVING AN INSERT FROM A PIPE CARRYING FLUID UNDER PRESSURE

Benjamin F. Tatterson, Pittsburgh, and Ward F. Gidick, West Newton, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 10, 1971, Ser. No. 197,320
Int. Cl. B23p *19/00*; B22d *19/10*
U.S. Cl. 29—200 D **6 Claims**



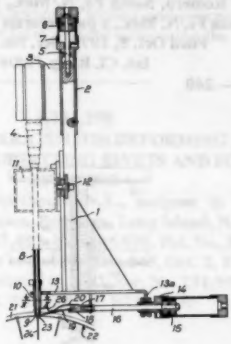
First and second cooperating enclosures surround a flanged joint in a conduit with means coacting with the enclosures and with the conduit to make the enclosure gas tight. An insert movably supported in the first enclosure is movable into position between the flanges when they are separated. Means is provided to separate the flanged joint and such means is also available to move the flange toward each other and into contact with the insert.

3,731,362

NUT RUNNING MACHINES

Julien Carminati, 13 Avenue de Thiou, 74 Annecy, France

Filed Dec. 20, 1971, Ser. No. 209,647
Claims priority, application France, Jan. 7, 1971, 71000397
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—200 P **3 Claims**



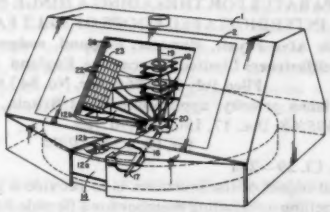
This invention relates to nut runners, particularly for running nuts on to bicycle wheels. Such machines conventionally comprise a running or driving head having a screwdriver blade engageable with the nut to be run and mounted in a telescopic guide sleeve caused to slide under the action of a jack over a support member, along the axis of a spoke placed opposite the blade by means of a step-wise movement of the wheel. The wheel is moved by means of a catch which is operated by a second jack in a direction substantially perpendicular to the movement of the head, which movement is synchronized with the advancing movement of the catch. In accordance with this invention, the catch is provided with means for positioning the blade with respect to a nut on a spoke during the nut running operation.

3,731,363

PRINTED CIRCUIT BOARD MANUAL ASSEMBLY DIRECTOR DEVICE

Richard L. Hall, Baltimore, and Carl F. Miller, Crofton, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 11, 1971, Ser. No. 123,257
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 B **5 Claims**



A printed circuit board manual assembly director device including: a compartmented rotary component tray having selectively accessible radial and circumferential compartments; drop-in modules each containing a system of light pipes and having a readout panel with component-lead-accom-

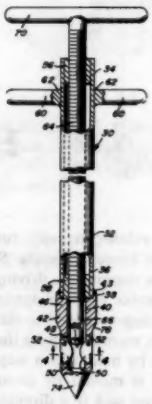
modating through holes for registry with the lead holes of a particular printed circuit board, and adjacent director-light through holes into which output ends of the light pipes extend; and, an illumination control system for the input ends of the module's light pipes to control their illumination selectively in accord with component tray compartment accessibility.

3,731,364

BROKEN SPRINKLER STANDPIPE REMOVING TOOL

Antonio S. Romero, Santa Fe, N. Mex., assignor to Boston E. Witt, Santa Fe, N. Mex., a part interest

Filed Oct. 5, 1970, Ser. No. 78,097
Int. Cl. B23p *19/04*
U.S. Cl. 29—240 **1 Claim**



A torque transfer tool including an elongated shank provided with a handle at one end and retractable gripping jaws at its other end. The other end of the shank is adapted to be telescoped into the broken end of a broken pipe section having its other end threadedly engaged with a supporting fitting and the tool jaws are extendable generally radially outwardly of the other end of the shank and supported therefrom for rotation therewith, whereby after insertion of the other end of the shank into the broken pipe section the jaws may be extended so as to frictionally grip the inner surfaces of the broken pipe section and the tool may be subsequently rotated about its longitudinal axis in order to unthread the broken pipe section from its supporting fitting.

3,731,365

APPARATUS FOR THREADING A HINGE PIN THROUGH INTERDIGITATED LOOPS OF BELT FASTENERS

Leslie Alva Fryatt, Huncoat, England, assignor to Mastabar Beltfasteners Limited, Lancashire, England

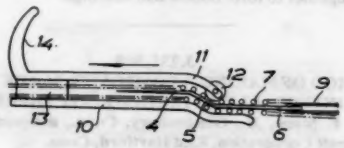
Filed July 22, 1969, Ser. No. 843,601
Claims priority, application Great Britain, July 26, 1968, 35,695/68; Dec. 17, 1968, 59,907/68
Int. Cl. B23p *19/04*
U.S. Cl. 29—241 **10 Claims**

An object of the invention is to provide a guide means for propelling a threading member for a flexible hinge pin through the interdigitated loops of belt fasteners in order to join belt ends together.

A further object of the invention is to provide a method of threading the flexible hinge pin through the loops of the fasteners.

One form of guide means for achieving these objects comprises a support plate for the underneath of the fasteners and a roller for contacting the top surface of the fasteners so as to act on an abutment on the threading member and so propel it through the loops, the roller being mounted at the trailing end of the guide means on an arm which is fixed to he support plate at the leading end of the guide means.

Another form of guide means comprises one or more rollers for supporting the underneath of the fasteners and one or



more rollers for contacting the top surface of the fasteners so as to act on the abutment of the threading member, the rollers being mounted at or adjacent to the trailing end of the guide means on arms extending from a body portion of the guide means.

The guide means may be arranged to interdigitate the loops in advance of the threading member.

3,731,366

METHOD OF MAKING FOUNTAIN PEN

Heinz Gunther Herrnring, Hamburg-Fuhlsbuttel, Germany, assignor to Montblanc-Simplo G.m.b.H., Hamburg, Germany

Division of Ser. No. 839,228, July 7, 1969, abandoned. This application March 15, 1971, Ser. No. 123,954
Int. Cl. B23p *17/00*
U.S. Cl. 29—423 **10 Claims**

A method of making a writing pen with capillary passages, which includes the steps of: providing a metal sheet at those areas thereof which are intended to contain capillary passages with grooves open at the top, filling the thus made grooves with a filling material adapted to be evaporated, covering up the thus filled grooves with another material the melting temperature of which is higher than the evaporation temperature of said filling material, removing the filling material by evaporation at a temperature lower than the melting point of said metal sheet and of said covering-up material, and finish-shaping and slotting the pin. Thus liquid ink is conveyed from an ink container through a capillary section to a gap leading to the writing tip of the pen while the foil forming the writing pen is covered and capillary passages lead into the pen gap, which passages have their opposite ends communicating with the ink container.

3,731,367

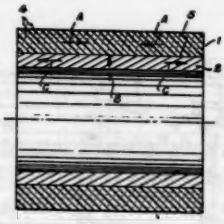
METHOD OF ASSEMBLYING COMPOUND BODY

Friedrich Laussermair and Karl Motz, both of Munich, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Germany

Filed Aug. 26, 1970, Ser. No. 67,100
Claims Priority, application Germany, Aug. 28, 1969, P 19 43 820.1
Int. Cl. B23p *11/02*
U.S. Cl. 29—447 **2 Claims**

An outer cylindrical body composed of a fiber reinforced thermal setting synthetic resin and a cylindrical inner metal

body are separately immersed in a bath of cyrogenic liquefied inert gas. The metal body shrinks and is then inserted in the



outer body. Upon being removed from the bath and heated, the metal body expands and becomes firmly bonded to the outer body to form the compound body.

3,731,368

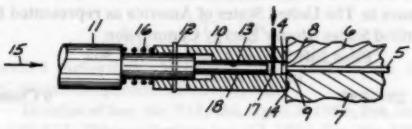
METHOD OF MAKING LEAD AND SOLDER PREFORM ASSEMBLY

Francis E. Dieteman and Nello Coda, both of Erie, Pa., assignors to Erie Technological Products, Inc., Erie, Pa.

Division of Ser. No. 848,456, Aug. 8, 1969, Pat. No. 3,616,981. This application June 1, 1971, Ser. No. 148,455

Int. Cl. B23k *21/00*

U.S. Cl. 29—470.1 **1 Claim**



Leads for electronic components are provided with solder preforms by a method and apparatus which first cuts off a length of solder wire and then forms the wire into a preform and cold welds it to the lead.

3,731,369

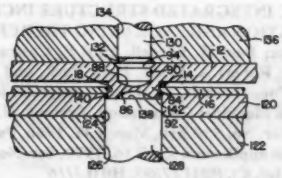
METHOD AND APPARATUS FOR FORMING AND SETTING RIVETS INTEGRAL WITH A LAYER

Verner A. Johnson, Livonia, Mich., assignor to Johnson Die & Engineering Co., Detroit, Mich.

Filed Oct. 27, 1971, Ser. No. 193,076

Int. Cl. B21d *39/00;* **B23p** *11/00*

U.S. Cl. 29—509 **12 Claims**



An assembly of two layers of metallic material conjoined by an extruded elongated rivet formed in and from one layer, and further extruded over and about the perimeter of an opening in the second layer, is disclosed. The second extrusion results in a lateral deformation conditioned by the first extrusion. The extruded elongated rivet form is developed through an extrude punch operation leaving a blind hole cavity in the rivet form with a depression at the base of the cavity and a depression on the exposed outer side of the rivet form, axially aligned and in opposing relationship with the cavity depression. Conjunction is obtained with the second perforated layer when the two layers are conjunctively arranged and the rivet form is further extruded. The inventive tooling and process for forming the extruded rivet form and for conjoining the two layers are also disclosed.

3,731,370

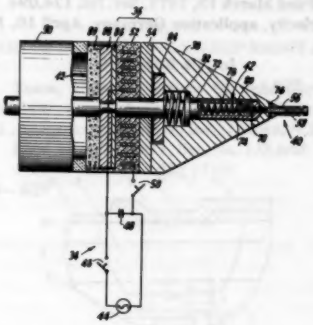
METHOD AND APPARATUS FOR DEFORMING A METAL WORKPIECE FOR UPSETTING RIVETS AND FOR BLIND RIVETING

Basil P. Leftheris, Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, Long Island, N.Y.

Division of Ser. No. 87,483, Nov. 6, 1970, Pat. No. 3,646,791, Continuation-in-part of Ser. No. 863,045, Oct. 2, 1969. This application March 6, 1972, Ser. No. 231,952

Int. Cl. B21d *39/00;* **B21j** *15/36*

U.S. Cl. 29—509 **4 Claims**



Method and apparatus for deforming a metal workpiece, for upsetting rivets, and for blind riveting which is accomplished by passing a stress wave through the metal workpiece or rivet sufficient to render it momentarily plastic and simultaneously forming it. The apparatus is basically comprised of means for generating a stress wave and a stress wave focussing device or amplifier. In operation, a workpiece is placed in a die or shaping means. The stress wave amplifier is then arranged to direct or focus the stress wave to the metal workpiece. Next, a stress wave is generated and passed through the stress wave focussing device, imparting a momentary state of plasticity to the metal workpiece. The momentarily plastic metal workpiece is then formed or shaped as desired.

3,731,371

SOLID ELECTROLYTIC CAPACITORS AND PROCESS

John Piper, and Roger J. Raschiotto, both of Greenville, S.C., assignors to Union Carbide Corporation, New York, N.Y.

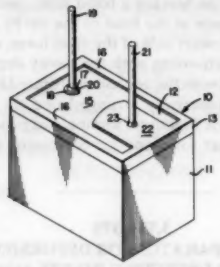
Division of Ser. No. 15,410, March 2, 1970, Pat. No. 3,611,054. This application March 22, 1971, Ser. No. 127,008

Int. Cl. B01j *17/00*

U.S. Cl. 29—570 **10 Claims**

The fabrication of hermetically sealed, radially leaded solid electrolytic capacitors by first forming a high temperature hermetic seal between a metallized ceramic header and a metal

sleeve, and then inserting a solid electrolytic capacitor having a first lead wire welded to the capacitors anode lead in the sleeve with the nickel lead wire extending through a metal-



lized opening in the header, solder sealing the other end of the metal sleeve, bonding the first nickel wire to the header as an anode lead and bonding a second nickel wire to the header as a cathode lead.

3,731,372

METHOD OF FORMING A LOW-OHMIC CONTACT TO A SEMICONDUCTOR DEVICE

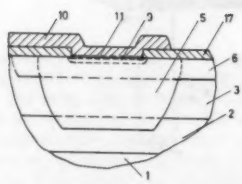
Wolfgang Kraft, Freiburg i. Br., Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed March 15, 1971, Ser. No. 124,094

Claims priority, application Germany, April 10, 1970, P 20 17 228.5

Int. Cl. B01j *17/00*

U.S. Cl. 29—590 **9 Claims**



A low ohmic contact for a semiconductor device is made to a p-conductivity type region by diffusing some n conductivity type phosphorous into said region before the contact metal is applied to said region. The amount of phosphorous is kept at a minimum to prevent the formation of an unwanted pn junction.

3,731,373

MANUFACTURING AN OPTICAL SHAFT ENCODER HAVING A HOLAGRAPHIC CODE DISK

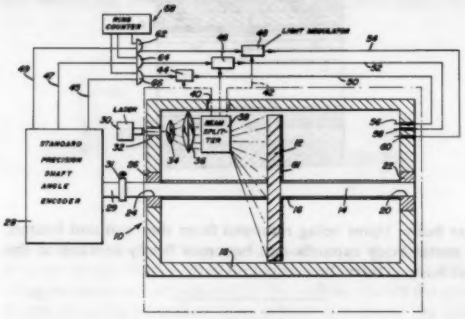
Richard N. Johnson, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1971, Ser. No. 210,415

Int. Cl. H01s *4/00*; **G02b** *27/00*

U.S. Cl. 29—592 **1 Claim**

A constant laser beam is directed toward a photosensitive code disk. A beam splitter diverts some light from the laser beam to drive first inputs of light modulators. The shaft of a standard reference shaft encoder is concentrically fixed to the disk and the encoder output bit lines are individually connected to second inputs of respective light modulators for selectively modulating the passage of light thereby generating light bit equivalents. The light bits are individually transmitted through fiber optics to projecting positions near the opposite side of the disk. By subjecting the disk to constant laser light on one side and changing bit light on the other side as the shaft



turns, a diffraction grating is formed on the disk as a latent image. The photosensitive disk is developed and forms a permanent optical encoder disk for future use.

3,731,374

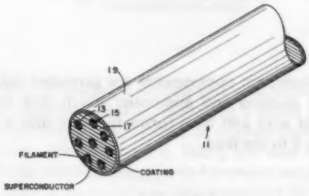
METHOD OF FABRICATING A HARD INTERMETALLIC SUPERCONDUCTOR BY MEANS OF DIFFUSION

Masaki Suenaga, Mastic Beach; William B. Sampson, Bellport, and David H. Gurinsky, Center Moriches, all of N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed July 20, 1971, Ser. No. 164,362

Int. Cl. H01v *11/00*

U.S. Cl. 29—599 **6 Claims**



Method of providing fine superconductors in a metal matrix wherein solid-state diffusion of a selected component from the matrix takes place and is "enhanced" by an externally added component to provide a desired superconductor alloy in the matrix.

3,731,375

MONOLITHIC INTEGRATED STRUCTURE INCLUDING FABRICATION AND PACKAGING THEREFOR

Benjamin Agusta; Paul H. Bardell; Paul P. Castrucci, all of Poughkeepsie; Robert A. Henle, Hyde Park, and Raymond P. Pecorato, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 539,210, March 31, 1966, Pat. No. 3,508,209. This application April 16, 1970, Ser. No. 33,127

Int. Cl. B01j *17/00*; **H01l** *1/16*

U.S. Cl. 29—577 **1 Claim**

A method of making a monolithic integrated semiconductor structure that has a plurality of functionally isolated individual cells that are electrically interconnected. Each of the cells is an object of mirror image cell that is vertically, horizontally

and diagonally displaced from the object cell. The plurality of cells provide a memory array with electrical components of each memory cell composed of active and passive semiconductor devices. Other importance aspects of the structure include underpass connections and active devices in a common portion of the structure which are electrically interconnected at the same node potential by means of a highly doped buried region within the common portion of the structure.

3,731,376

METHOD OF MAKING A CATHETER

Bernard Ackerman, Metuchen, N.J., assignor to Electro-Catheter Corporation, Rahway, N.J.

Division of Ser. No. 718,434, April 3, 1968, Pat. No. 3,590,822. This application Jan. 22, 1971, Ser. No. 108,742

Int. Cl. H01b *13/00*

U.S. Cl. 29—624 **13 Claims**

Electro-conductive catheters and methods of manufacture thereof.

3,731,377

METHOD FOR HANDLING BEAM-LEAD AND ODD-SHAPED SEMI-CONDUCTOR DEVICES

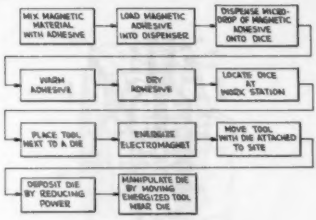
William L. Muckelroy, P.O. Box 9685, Washington, D.C.

Filed Aug. 19, 1971, Ser. No. 173,186

Int. Cl. H05k *3/30*

U.S. Cl. 29—626 **13 Claims**

An apparatus and method for manipulating monolithic microelectronic dice are provided. The apparatus comprises a probe-like electromagnet which uses a variety of different shaped tips to change the configuration of the magnetic field. The magnetic field at the tip is further adjusted by reversing the polarity of the electricity in the electromagnet windings and controlling the power applied to these windings. The core of the electromagnet is maintained in a demagnetized state by switching the electrical polarity of the windings. The method comprises the steps of applying a magnetically permeable substance to the dice, attaching each of the dice to the electromagnet using the force of the magnetic field, moving the attached die to a preferred location and orientation and releasing said die. Said magnetically permeable substance may comprise a fluid adhesive with a magnetically permeable insulated powder mixed therein, a permeable metal formed in beam-leads, or a permeable metal formed into bumps on the surface of flip-chips.



3,731,378

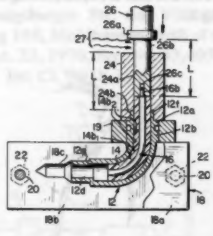
METHOD OF ASSEMBLING SWEEP RIGHT ANGLE CONNECTOR

Joseph R. Toma, Colonia; Oliver C. Johnson, Irvington; Amelia M. Mitreuter, Colonia, and Charles C. Ward, Brielle, all of N.J., assignors to Astrolab, Inc., Linden, N.J.

Filed April 29, 1971, Ser. No. 138,648

Int. Cl. H02g *15/00*

U.S. Cl. 29—629 **14 Claims**



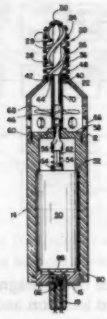
A method is disclosed for constructing a right angle connector having a curved sweep instead of the conventional sharp or mitred corner. The connector includes a main curved shell, an internal notched insulator or dielectric and a central contact assembly. The contact assembly, which can take the form of a narrow conductor having a pointed tip, is inserted in a central bore in the insulator. The insulator is then lodged within the internal chamber of the connector body by inserting the insulator into a guide block through the bore of which an extrusion-type plunger is then forced, thereby driving the insulator and central conductor into the connector body. Because of its partially notched surface, the insulator maintains its structural integrity as it is compressed around the curve of the connector body and assumes the dimensions of that curve. The connector is thereby formed with all internal elements exhibiting the desired smooth sweep, and the connector may be adapted to receive a variety of fittings and terminations.

3,731,379

HAIR CUTTING APPARATUS

Reed F. Williams, 4522 East Chapman, Orange, Calif.

Filed Dec. 17, 1971, Ser. No. 209,164
Int. Cl. B26b *19/06*
U.S. Cl. 30—29.5 5 Claims



This invention relates to improvements in apparatus for cutting hair. The invention employs a novel hair cutting means which in the embodiment illustrated comprises a pair of cutting blades, one formed as a sheath within which the other blade is contained. Perforations in the wall of the sheath blade are arranged to admit the ends of the hairs to be cut into the interior of the sheath where the second blade, which has helical cutting edges, cooperates with the sheath to effect a shearing action.

3,731,380

CHAIN-SAW EXTENSION POLE

Robert G. Mathiesen, 2200 Canehill Avenue, Long Beach, Calif.

Filed Dec. 20, 1971, Ser. No. 210,003
Int. Cl. B27b *17/02*; A01g *3/08*
U.S. Cl. 143—32 L 6 Claims

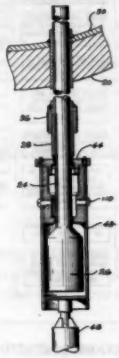
An extension pole for a chain saw with an elongate handle with front and rear ends and occurring in a common vertical plane with the center of gravity of the saw and an axis concentric with the designed longitudinal axis of rotation for the saw, said pole having mounting means releasably engageable with the saw handle with the axis of the pole substantially concentric with and projecting rearwardly from the handle. Manually operable throttle control means carried by the mounting means to engage a throttle trigger carried by the handling and including an operating line extending longitudinally of the pole. The mounting means engaging only the handle of the saw and being releasably secured with the saw without engagement of fasteners in and with the saw structure.

3,731,381

ROTATABLE WELD CUTTING TOOL

Scott R. Penfield, Jr., and Warren W. Roberts, both of Chattanooga, Tenn., assignors to Combustion Engineering Inc., Windsor, Conn.

Filed Nov. 18, 1970, Ser. No. 90,510
Int. Cl. B25f *3/00*; B26b *1/00, 3/00*
U.S. Cl. 30—124 7 Claims



Apparatus is disclosed for detaching seal-welded heater elements from assembly with the pressurizer of a pressurized water nuclear power system. The heater elements are of the type that are connected to the pressurizer by both a seal weld and a mechanical back-up connection. The disclosed arrangement involves the use of the nut that forms part of the back-up connection as means for connecting a rotary weld cutter to its drive motor. A weld cutter of particular design capable of removing the seal weld without damaging the heater element is also described.

3,731,382

EXTENSIBLE CHAIN SAW

Dwight W. Wroe, 6530 Hugo Road, Grants Pass, Oreg.

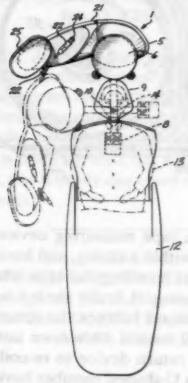
Filed June 1, 1971, Ser. No. 148,620
Int. Cl. B27b *17/02*
U.S. Cl. 30—381 7 Claims

Provision is made of light but strong and rigid, optionally usable, sectional means, adapted to be interposed between the motor unit and the cutting chain unit of a conventional chain saw, for extending the saw to different selected lengths, whereby a man standing on the ground may cut through branches of substantial thickness, located at substantial distances above the ground.

3,731,383
DENTAL CHAIR

Kazuo Hayashi, Kyoto, Japan, assignor to Kaubshiki Kaisha Morita Seisakusha, Fushimi-ku, Kyoto, Japan

Filed March 8, 1971, Ser. No. 121,730
Claims priority, application Japan, March 23, 1970, 45/24225
Int. Cl. A61c 19/02
U.S. Cl. 32—22 7 Claims

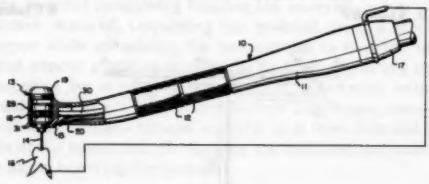


A dental chair comprising a chair body for a dentist to be seated in while performing treatment and a wing connected to one side of said chair body swingably relative thereto and having means for detachably holding therein various instruments used for dental treatment.

3,731,384
MEDICAL INSTRUMENT

Bernard Brooks, Belle Harbor, N.Y.; Jerome Farber, Cherry Hill, and Theodore Roseman, Westmont, both of N.J., assignors to Electro-Dent, Inc., Cherry Hill, N.J.

Filed April 22, 1971, Ser. No. 136,518
Int. Cl. A61c 1/10
U.S. Cl. 32—27 9 Claims

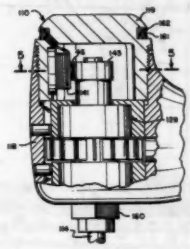


A medical device is disclosed, which employs a form of electric desensitization in connection with the use of pain-producing medical tools. The device is particularly useful in connection with dental drilling operations and includes, in the preferred embodiment, a coil mounted within a dental handpiece and a rotating permanent magnet mounted so that its magnetic flux overlaps the coil windings. Rotation of the magnet induces an electric current in the coil which flows through the drill and into the tooth to desensitize the nervous system of the tooth upon contact.

3,731,385
DRILLING APPARATUS

Jerome Farber, Cherry Hill, and Theodore Roseman, Westmont, both of N.J., assignors to Electro Dent, Inc., Cherry Hill, N.J.

Filed April 15, 1971, Ser. No. 134,295
Int. Cl. A61c 1/10
U.S. Cl. 32—27 3 Claims

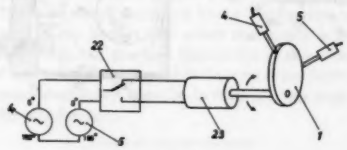


A medical device is disclosed, which employs a form of electric desensitization in connection with the use of pain-producing medical tools. The device is particularly useful in connection with dental drilling operations and includes, in the preferred embodiment, a coil mounted within a dental handpiece and a rotating permanent magnet mounted so that its magnetic flux overlaps the coil windings. Rotation of the magnet includes an electric current in the coil which flows through the drill and into the tooth to desensitize the nervous system of the tooth upon contact. An improved turbine bearing assembly is included, having an elongated substantially tubular hub interconnectable with an elongate collet to form a rotary chuck, preferably adapted to be used in a dental drilling handpiece. The invention also includes apparatus for manipulating this rotatable chuck.

3,731,386
MEASURING DEVICE FOR DETERMINING THE ANGULAR POSITION OF A CAM

Kurt Kreiensen, Konigsberger Str. 5a, Villingen, and Karl Hutter, Lerchenweg 195, Muhlhausen, both of Germany

Filed Oct. 23, 1970, Ser. No. 83,405
Int. Cl. G01b 5/24
U.S. Cl. 33—1 PT 9 Claims



The invention relates to a measuring device for determining the angular position or orientation of a cam, with an electrical length measuring follower, the pin of which bears radially on the rotary cam and produces a measurement voltage representative of the radial measurement of the cam at any given moment.

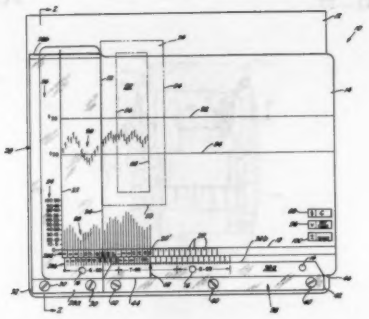
3,731,387
STOCK MARKET CHARTING APPARATUS

John W. Slemmons, 19142 Glen Albyn, Orange, Calif.

Filed Sept. 9, 1969, Ser. No. 856,359
Int. Cl. B43l 7/00
U.S. Cl. 33—76 R 15 Claims

Apparatus for plotting stock market data. Included is a rectangular rule having along the edges of a central rectangu-

lar opening a plurality of scales of different incremental spacing. A charting sheet is positioned with an edge against a chart guide and with a selected point on the abcissa aligned with an index mark on the chart guide. When the rule is placed against a rule guide, a scale edge of the rule is lined up with the



selected point, thereby facilitating easy entry of prices, volume or other data. In one embodiment the chart and rule guides are mounted on a notebook cover; in another embodiment the guides are combined in a unitary member adapted to engage an edge of the charting sheet.

3,731,388

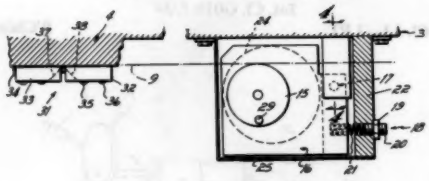
MEASURING METHOD AND APPARATUS

Robert K. Burroughs, Batavia, and Timothy A. Wakefield, Cincinnati, both of Ohio, assignors to R. K. LeBlond Machine Tool Company, Cincinnati, Ohio

Filed Nov. 3, 1970, Ser. No. 86,488

Int. Cl. G01b *3/12;* **B23a** *15/00*

U.S. Cl. 33—125 M **24 Claims**



A method and apparatus for measuring movement of one element relative to another as, for example, a machine tool slide relative to a bed. The measurement is effected by rolling a disc over a flat reference surface. The disc in turn controls an electrical signal generator such as a resolver or an encoder which generates an electric signal indicative of the displacement of the disc relative to the reference surface. The effective rolling diameter of the disc is accurately controlled by preloading the disc into frictional engagement with the reference surface. A pin secured in an eccentric position on the disc is periodically passed over or through a synchronizing or rezeroing element so as to periodically and automatically synchronize or reset the disc relative to the reference surface and thereby eliminate cumulative error which might otherwise result from slippage or diametral errors between the two friction bearing surfaces.

3,731,389

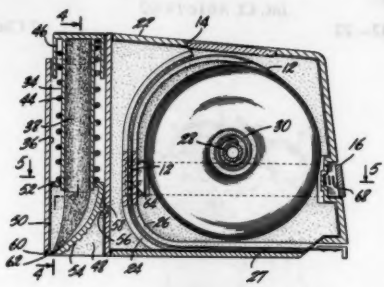
TAPE MEASURING DEVICE

Bernard King, 130 Madison Avenue, New York, N.Y.

Filed May 7, 1970, Ser. No. 35,391

Int. Cl. B43l *9/04*

U.S. Cl. 33—189 **13 Claims**



Disclosed herein is a tape measuring device comprising a measuring tape coiled within a casing, and having a spring actuated return device for recoiling the tape when it has been withdrawn from the casing. A brake device is spring loaded within the casing to counter balance the return force so that the measuring tape will remain withdrawn until the brake is released to permit the return device to re-coil the tape. The brake device includes a U-shaped member having fingers projecting inwardly in a face-to-face manner from the free ends of the U-shaped member for pressing the tape against an internal wall of the casing under the force of a coil spring disposed between the casing and inner face of the bight portion of the U-shaped member. The tape measuring device also comprises a marking mechanism, disposed within the casing at the ends thereof opposite the end at which the tape is withdrawn, and including a marking element which is spring biased upwardly, but which may be depressed to place a mark on the surface being measured. The indicia on the tape are read through a window in the top of the casing, and the reading is arranged to correspond exactly with the distance between the marking element and the free end of the tape.

3,731,390

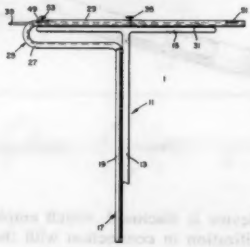
LAYEROUT GAUGE

John L. Sloan, 1669 Loma Avenue, Long Beach, Calif., and Palmer B. Peters, 2825 Knode Street, Torrance, Calif.

Filed Nov. 1, 1971, Ser. No. 194,720

Int. Cl. B23b *49/02;* **G01b** *5/14*

U.S. Cl. 33—189 **8 Claims**



A tool for use by structural steel layerout men which allows the simultaneous marking of beam shear lines and hole positions in both the flange and web of the beam, the tool including a unitary broad strip frame member formed with a flat web portion to lie adjacent the beam's web and a U-shaped flange portion fitted over the beam's flange, the web portion and a

flange portion mounted movable flange gauge strip both include a plurality of gauge slots for respectively laying out the web and flange of a structural beam while shear lines perpendicular to the elongate outer surface of the beam's flange may be marked off on the beam's web along the parallel side edges of the web portion of the tool.

3,731,391

METHOD OF DRYING PIGMENTS

Hans R. Schweizer, Reinach, Basel-Land, Switzerland, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed April 22, 1971, Ser. No. 136,583

Int. Cl. F26b *5/06*

U.S. Cl. 34—5 **11 Claims**

A process for drying a wet mass of finely divided and dispersed pigment particles comprising forming a mixture of a suitable organic solvent and the pigment particles, freezing the mixture, and thereafter subliming the organic solvent from the pigment particles under a reduced pressure. The resulting dried pigment is finely divided, has a soft texture and a low apparent density, and is easily dispersed in either hydrophobic or hydrophilic media.

3,731,392

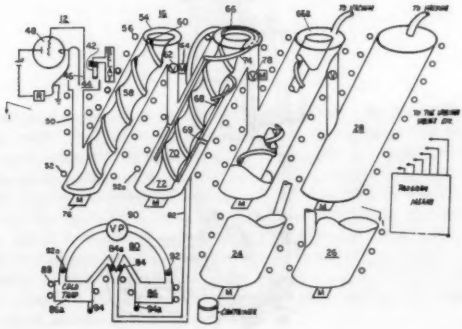
CONTINUOUS FREEZE DRYER

Herbert Gottfried, 3441 5th St., Ocean Side Long Island, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,934

Int. Cl. F26b *5/06*

U.S. Cl. 34—5 **12 Claims**



Arrangement for continuously and automatically lyophilizing material comprising freezing the material, pulverizing the frozen material, circulating the material along a screw conveyor while exhausting the ambient gas to heat the material and expose particles of material to heat, regulating the heat supplied by reversible refrigeration, alternately exhausting said ambient gas in first and second cold traps, sequentially finishing partially treated material in at least first and second finishing zones and discharging the material into containers without breaking the vacuum.

3,731,393

METHOD OF AND APPARATUS FOR FLUIDIZING PARTICULATE SUBSTANCE

Katsuto Okada, Tokyo, and Fumio Kato, Kawasaki, both of Japan, assignors to Morinaga Nyugyo Kabushiki Kaisha, Tokyo, Japan

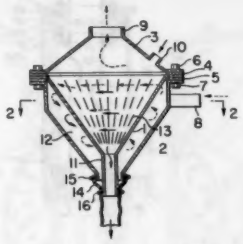
Filed June 9, 1971, Ser. No. 151,363

Claims priority, application Japan, June 13, 1970, 45/50903

Int. Cl. F26b *3/08*

U.S. Cl. 34—10 **8 Claims**

A fluidized bed of solid particles, for instance of spray dried milk, is formed along a funnel wall by conveying the particles supplied to the upper funnel edge from above along the wall or by a body of gas which is introduced through a plurality of slits in the wall preferably in a direction substantially tangential to



the circular cross section thereof to form a gas vortex. The gas vortex is preferably so distributed that its velocity is in direct proportion to the diameter of the conical wall.

3,731,394

CENTRIFUGAL DEHYDRATOR

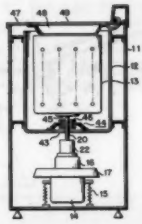
Masayuki Onishi, Nagoya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 13, 1971, Ser. No. 207,389

Claims priority, application Japan, Dec. 11, 1970, 45/124629

Int. Cl. F26b *17/24*

U.S. Cl. 34—58 **7 Claims**



A centrifugal debydrator wherein the drive of a motor is transmitted to a rotatable support through a drive transmission mechanism which renders a brake mechanism inoperable and rotates a spin basket and when the motor is brought to stop by the inertia of the spin basket the brake mechanism is actuated and rotatable support is disconnected from the drive transmission mehanism thereby to immediately stop the rotation of the spin basket.

3,731,395

APPARATUS FOR EXTRACTING LIQUID FROM CLOTH

Gentaro Watanabe, Kyoto, Japan, assignor to Uenoyama Kiko Co., Ltd., Kyoto, Japan

Filed Dec. 4, 1970, Ser. No. 95,243

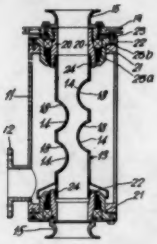
Claims priority, application Japan, Dec. 12, 1969, 44/100405; Dec. 13, 1969, 44/100343; April 8, 1970, 45/33855

Int. Cl. F26b *13/30*

U.S. Cl. 34—92 **4 Claims**

This invention provides a method and apparatus which may be used for vacuum extraction of liquids. The method comprises applying a radially outwardly directed vacuum suction force to cloth in rope form which has been treated with any desired solution and has said liquid content absorbed thereon. The apparatus comprises a vacuum vessel, a pipe body in-

stalled in and across said vacuum vessel and having a plurality of slits or openings formed in the peripheral wall thereof to establish communication between the interior and exterior of



the pipe body, and means whereby cloth in rope form treated with any desired solution and having said liquid content absorbed thereon is moved through said pipe body at a suitable speed.

3,731,396

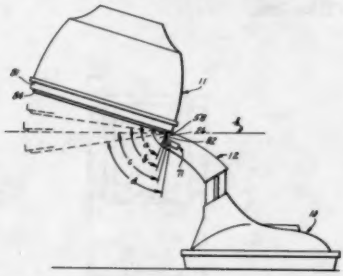
HAIR DRYER WITH SELECTIVE TILTABLE HOOD

James O. McLean, Milford, Conn., assignor to General Electric Company, Bridgeport, Conn.

Filed Jan. 28, 1972, Ser. No. 221,748

Int. Cl. A45d *20/24*

U.S. Cl. 34—99 **9 Claims**



A hair dryer that may be collapsed for carrying and erected for operation, including a base assembly, a rigid tiltable hood assembly to be positioned about the head of the user for distributing heated air to the head and a strut assembly for supporting the rigid hood assembly elevated from the base assembly. The strut assembly includes two members hingedly attached to each other with one of the members being secured to the hood assembly. One of the members has a support shoulder and the other member has an opening in the walls. A resiliently mounted depressible limiter member having a step-like portion is located in the wall opening and protrudes through the opening such that the limiter member cooperates with the support shoulder to apply supporting force to the hood assembly at various tilt positions.

3,731,397

CEMENT CLINKER COOLER

Karl-Heinz Kayatz, Hamburg-Nienstedten, and Paul Schreiner, Papenwisch, both of Germany, assignors to Fuller Company, Catasauqua, Pa.

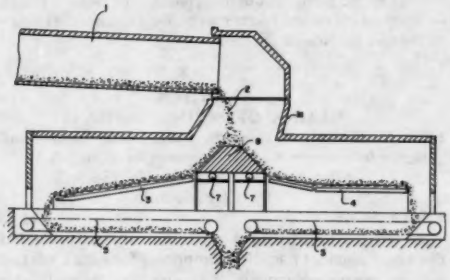
Filed Oct. 14, 1970, Ser. No. 80,731

Claims priority, application Germany, Oct. 17, 1969, P 19 52 324.1

Int. Cl. F27b *7/38*

U.S. Cl. 263—32 R **8 Claims**

Cement clinker cooler apparatus which includes a pair of grate type clinker coolers with opposite working directions. The hot clinker from the kiln is deposited on a distributor which directs the clinker in desired proportions to the two



coolers. The distributor is adjustable to control the proportion of clinker supplied to each cooler. Several distributor configurations are disclosed.

3,731,398

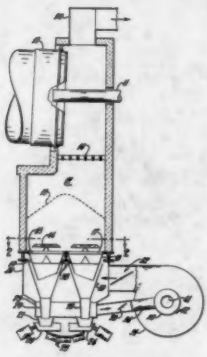
APPARATUS FOR COOLING PARTICLES

Lee H. Niems, 2702 Brassie, Flossmoor, Ill.

Filed May 10, 1971, Ser. No. 141,667

Int. Cl. F27b *7/00*

U.S. Cl. 34—169 **20 Claims**



Apparatus for cooling heated pieces of matter and particularly calcined lime pebbles or particles in which cooling air is introduced under positive pressure into a downwardly moving mass of particles which is adjustable for uniform cooling throughout. This is accomplished by providing air inlets adjustably positionable horizontally within the bed, dependent upon the horizontal corss-sectional shape of the bed and the pattern of particle size distribution therein. Uniformity of cooling is further promoted by positioning each air inlet along a line which coincidently divides its section of bed symmetrically into like horizontal cross-sectional shapes as well as like patterns of particle size distribution.

3,731,399

DEVICE AND METHOD FOR BRIDGE INSTRUCTION

Edward L. Gordy, and Laura Jane Gordy, both of 424½ Brazilian Avenue, Palm Beach, Fla.

Filed June 18, 1971, Ser. No. 154,643

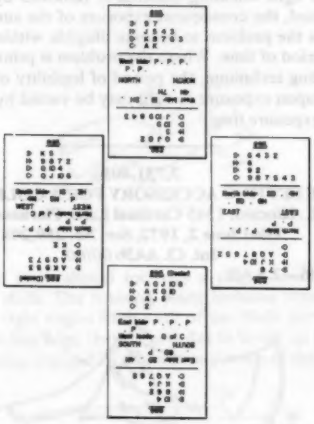
Int. Cl. G09b *19/22*

U.S. Cl. 35—8 B **9 Claims**

This disclosure described an instructional device and method for teaching the proper bidding and opening leads in

the game of bridge. The device includes a set of four bidding charts, e.g., on separate cards, one for each player. Each bidding chart includes an identification of the playing cards of the bridge hand for the particular player and an identification of the seating position for that player, i.e., north, east, south or west. Each chart also includes a bidding sequence showing the correct sequence of bids for the next preceding bidder. One of the charts, that of a player other than the opening leader, will indicate the correct opening lead against the correct final contract.

In teaching bridge with this device each player is given his bidding chart and the player selects the proper playing cards



indicated on his chart for his bridge hand from a deck of playing cards. The players bid their hands in accordance with the normal sequence of bidding used in the game of bridge and if any player makes an incorrect bid, the next succeeding bidder can consult his bid chart and inform the prior bidder whether or not he has made an incorrect bid. The prior bidder can then try again to make the correct bid or eventually be told what the bid should be. Once the bidding is complete, the opening leader selects his lead and if the lead is incorrect he can be corrected by the player on whose chart the opening lead is indicated, usually the declarer.

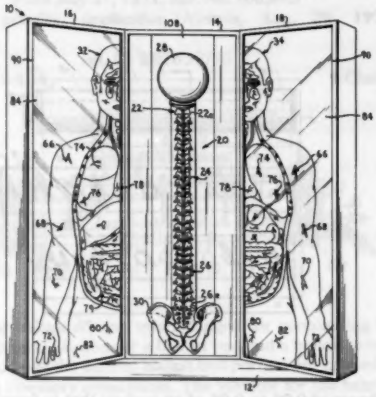
3,731,400

SPINAL NERVE TRACER

Donald L. Pile; Charles E. Grandell; Arthur H. Flye, and Henry R. Scheuermann, Sr., all of Topeka, Kans., assignors to said Pile, by said Grandell, Flye, and Scheuermann

Filed Jan. 24, 1972, Ser. No. 220,262
Int. Cl. G09b *23/32*
U.S. Cl. 35—17 **10 Claims**

Display apparatus for instructional and demonstrative purposes and for use by practitioners in the healing arts. The apparatus employs a simulated, erect human spine having a series of vertebrae, each rotatable to the left or right or shiftable out of proper lateral alignment to simulate a misalignment condition. Pictorial illustrations of the left and right sides of the human anatomy in frontal views flank the spine on opposite sides thereof, and have transparent zones at selected terminal nerve endings of the spinal nerves. Electric lamps are disposed behind the illustrations adjacent the respective zones. As a particular vertebra is rotated or shifted out of proper alignment, the appropriate lamp or group thereof are energized to illuminate the corresponding zone or zones to thereby visually indicate the organ, muscle, bone or tissue structure affected by interference with the spinal nerve



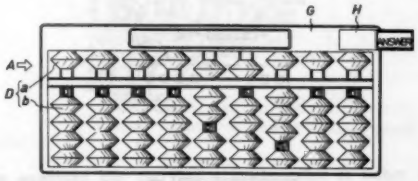
emanating from the displaced vertebra. In this manner, nerve impulses are traced from the emission of particular spinal nerve at the intervertebral foramen level to the affected nerve endings.

3,731,401

ABACUS INSTRUCTION DEVICE

Tsuneji Kojima, No. 65, Higashi-Sugi-Machi, 2-chome, Kita-ku, Nagoya-shi, Japan

Filed Feb. 11, 1972, Ser. No. 225,518
Claims priority, application Japan, May 21, 1971, 46/41194
Int. Cl. G06c *1/00*
U.S. Cl. 35—33 **1 Claim**



An abacus instruction device, which enables answer numerals to be exposed below the moved beads, being effective as instruction device for pupils and foreigners.

3,731,402

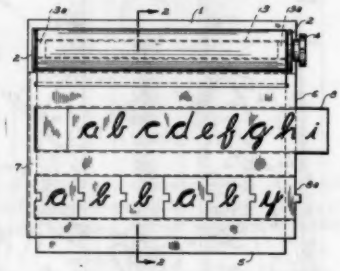
EDUCATIONAL DEVICE

Gertrude M. Paul, 98 Lakeview Lane, Chagrin Falls, Ohio

Filed March 8, 1971, Ser. No. 121,816
Int. Cl. G09b *11/04*
U.S. Cl. 35—37 **12 Claims**

An educational device including a base plate, a front frame having its left edge secured to the left edge of the base plate and a roll having paper thereon secured to the upper end of the base plate which roll is provided with a knob which a pupil may rotate with one hand while he pulls the free end of the paper downwardly between the base plate and the frame. The front frame is provided with an elongated opening for receiv-

ing a slide having letters or numerals stencilled therein. The slide maybe formed of a single piece or a plurality of connected segments which slide is held stationary within the frame by suitable means, such as by bevelled edges which engage bevelled edges at the openings in the front frame. The stencil is preferably formed of a plastic material having a



thickness of 0.05 to 0.06 of an inch so that in forming letters or numerals, the pencil will follow a definite pattern. If desired, small numerals may be etched or printed upon the stencil adjacent each letter or numeral to show the progressive strokes of the pencil which are utilized in forming the letters or numerals.

3,731,403

PROGRAMMED TEACHING DEVICE

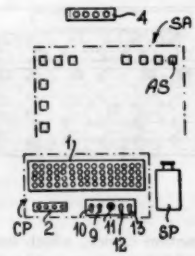
Arye L. Mandelbaum, 8 Weitzbard St., Rishon-Le-Zion, Israel

Filed June 19, 1972, Ser. No. 264,270

Claims priority, application Israel, June 29, 1971, 37179

Int. Cl. G09b *7/06*

U.S. Cl. 35—48 R **7 Claims**



A programmed teaching apparatus for use with a slide projector for teaching a group of students, comprises a magazine for holding a plurality of slides each containing a question and multiple-choice answers, an answer selector for each student, a control panel having a student answer display for each student, a correct answer display on the control panel viewable only by the instructor, and a program plate attached to the slide magazine so as to be automatically advanced with it. The program plate includes a field for each slide recorded in accordance with the correct multiple-choice answers of the respective slide. A second correct answer display is provided so as to be viewable by the students, and a switch under the control of the instructor selectively connects the latter display to the instructor's correct answer display.

3,731,404

TESTING FORM AND SYSTEM

Albert C. Masterson, 1048 Montview Road, Fort Collins, Colo.

Filed April 19, 1971, Ser. No. 135,364

Int. Cl. G09b *1/00*

U.S. Cl. 35—48 R **1 Claim**

A testing form and system for testing the ability of a person to comprehend and carry out or follow written instructions. A test problem or set of instructions is printed on a photosensitive surface, preferably by a contact printing technique, and the form is then light sealed, as by placing it in an opaque envelope or detachably bonding a layer of opaque material over the photosensitive surface. The photosensitive characteristics of the surface on which the problem is printed are such that when the light shielding material is removed by the person being tested, the consequent exposure of the surface to light will cause the problem to become illegible within a predetermined period of time. Where the problem is printed by a contact printing technique, the period of legibility of the printed problem upon exposure to light may be varied by varying the printing exposure time.

3,731,405

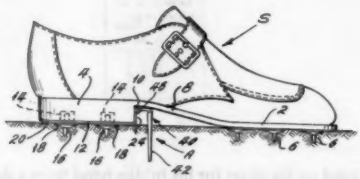
TEE SETTING ACCESSORY FOR A GOLF SHOE

William C. Kincaid, 1345 Cardinal Lane, Florissant, Mo.

Filed June 2, 1972, Ser. No. 259,204

Int. Cl. A43b *00/00*

U.S. Cl. 36—2.5 AH **11 Claims**



A tee setting accessory for a golf shoe includes a setting spike which is attached to the heel of the golf shoe by means of a base plate and when so attached is capable of folding between extended and retracted positions. When in the retracted position the setting spike lies above the traction spikes on the golf shoe and does not interfere with normal use of the shoe. When in the extended position the setting spike projects downwardly from the underside of the shoe a distance greater than the projection of the traction spikes, and when so extended it may be forced into the ground to form a pilot hole to facilitate setting a golf tee.

3,731,406

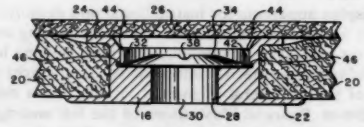
SPORT SHOE WITH QUICKLY REMOVABLE SPIKES

Robert F. Young, 322 E. Central Avenue, Pearl River, N.Y.

Filed April 13, 1972, Ser. No. 243,612

Int. Cl. A43c *15/00*

U.S. Cl. 36—67 D **12 Claims**



The spikes are quickly released from their connection with the sport shoe by a one-quarter turn rotation, and then an

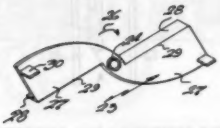
axial withdrawal. Replacement spikes, or stub spikes adapting the shoe for street use, can then be quickly installed by reversing the above steps.

3,731,407

POWER SNOW SHOVEL

Harry Indzeoski, 729 Scotland Avenue, Winnipeg, Manitoba, Canada

Filed Feb. 7, 1972, Ser. No. 223,953
Int. Cl. E01h *5/00*
U.S. Cl. 37—43 B **2 Claims**



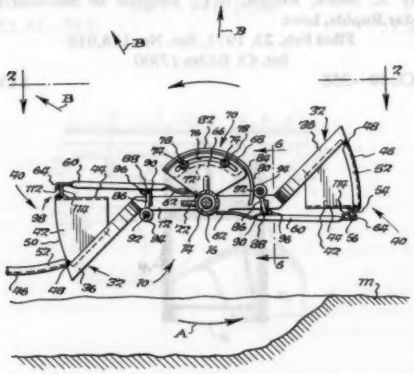
A powered snow shovel includes a single handle and is mounted on skids. The rotating blade includes breaker lugs extending at right angles from each of the blade portions adjacent the leading edge thereof in order to break up the snow prior to its being engaged by the blower portion of the blades.

3,731,408

CENTRIFUGALLY DISCHARGING SCOOP SHOVEL ASSEMBLY

Frank C. Neal, 14 Lincoln St., Cattaraugus, N.Y.

Filed April 21, 1971, Ser. No. 136,028
Int. Cl. E02f *5/08*
U.S. Cl. 37—91 **9 Claims**



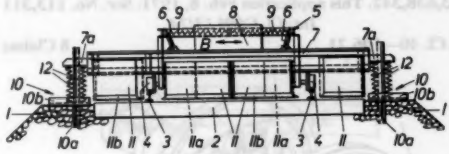
A scoop shovel assembly having a rotatable arm carrying shovels at the opposite ends thereof. Each shovel has a pivotable bottom wall held in the closed position by a resilient latch member. Means are provided on the shovel for disabling each latch member at a predetermined point in the path of rotation of the associated shovel enabling the bottomwall to swing open by centrifugal forces.

3,731,409

BALLAST COMPACTING AND LEVELING APPARATUS

Ludwig Schenkir, and Josef Dultinger, both of Perchtoldsdorf, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed July 27, 1971, Ser. No. 166,493
Claims priority, application Austria, Aug. 20, 1970, 7550/70
Int. Cl. E01b *37/00*
U.S. Cl. 37—104 **8 Claims**



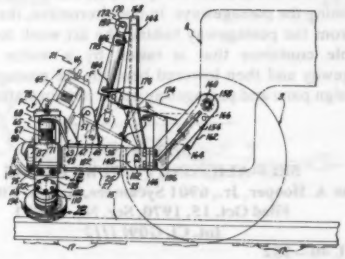
A pair of ballast compactors arranged for compacting the two outer lateral portions of a ballast bed and a ballast leveler arranged to level the central ballast bed portion are carried by a common vibratory cross beam. The vibrator for the beam is arranged centrally thereof.

3,731,410

MOTOR GRADER WITH DEVICE FOR GUIDING VEHICLE ALONG A PAIR OF PARALLEL RAILS

Gordon L. Cripe, Boise, Idaho, assignor to Morrison Knudsen Company, Inc., Boise, Idaho

Filed April 21, 1971, Ser. No. 136,156
Int. Cl. E02f *5/22*; **B61f** *1/00*
U.S. Cl. 37—104 **25 Claims**



An equalizer bar carrying a guide roller at either end thereof, is pivotally connected at its midportion on a ballast support member which is mounted on one end of a road vehicle. The ballast support member and the equalizer bar are movable vertically between a lowered operative position with the guide rollers in engagement with parallel rails and a raised inoperative position by power means such as a hydraulic cylinder controlled by the operator of the vehicle. A similar device is mounted at the other end of the vehicle for guiding it as it moves in either a forward or rearward direction.

3,731,411

PROCESS FOR PRODUCING DURABLE PRESS TEXTILES

Richard P. Barber, and Glen R. Moses, both of Mooresville, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed June 11, 1971, Ser. No. 152,428
Int. Cl. D06m *13/54, 13/40*
U.S. Cl. 38—144 **8 Claims**

Disclosed herein is a process for producing a durable press cellulosic textile fabric comprising to the fabric applying an

aqueous mixture of a thermosetting durable press textile reactant, and a crosslinking acrylic polymer, a crosslinking catalyst, making the fabric into a garment or article and subsequently pressing and curing said mixture on the article.

3,731,412

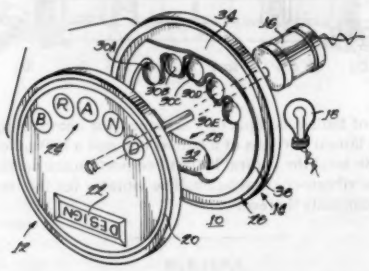
DISPLAY APPARATUS

Frank Thomas Winslow, 4611 S. Whipple Avenue, Chicago, Ill., and Robert Bernard Stanish, 3023 S. Farrell, Chicago, Ill.

Continuation-in-part of Ser. No. 865,925, Oct. 13, 1969, Pat. No. 3,638,342. This application Feb. 8, 1971, Ser. No. 113,311

Int. Cl. G09f *13/24*

U.S. Cl. 40—106.21 8 Claims



Art work formed as colored translucent lines and areas on a design pane is illuminated to provide a changing display as a passageway panel between the design pane and a source of light rotates with the design pane to cause liquid in the passageway panel to flow from a passageway that is between the art work and the source of light to another passageway in the passageway panel where it does not block light from the art work. The art work may be illuminated progressively in any direction and at different speeds and locations by properly positioning the passageways. In the alternative, the liquid may flow from the passageway behind the art work to a separate movable container that is raised by a motor above the passageway and then lowered beneath the passageway while the design pane and passageway panel remain stationary.

3,731,413

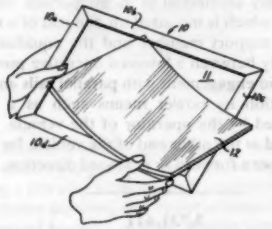
SELF-ALIGNING PICTURE FRAME

William A. Hooper, Jr., 6901 Sycamore, Kansas City, Mo.

Filed Oct. 15, 1970, Ser. No. 80,971

Int. Cl. G09f *1/12*

U.S. Cl. 40—152 2 Claims



A picture frame construction includes an integrally attached backing to the picture frame. The inner peripheral edge of the frame is slotted with one side of the slot being coincident with the forward surface of the backing. Spring biased picture positioning members resiliently engage preselected edges of a picture being inserted through the face of the frame to automatically align the picture for proper display purposes within the peripheral slot.

3,731,414

ANIMAL EAR TAGS AND APPLICATORS THEREFOR

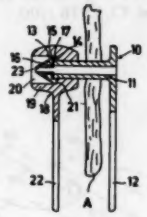
Brian Egmont Murphy, Mangawhere Road, Kaponga, Taranaki, and John Reginald Burford, 604 Main Street, Palmerston North, both of New Zealand

Filed April 29, 1971, Ser. No. 138,575

Claims priority, application New Zealand, Feb. 5, 1971, 162709

Int. Cl. G09f *3/12*

U.S. Cl. 40—301 9 Claims



An animal ear tag comprising two components formed of a plastics or other resilient material, a first component having a hollow stem with a flanged end which has a spike of hard plastic or other rigid material shaped from its back end with a hole for the reception of a guide pin of a reusable back plate, and the second component having a boss with a hole for fitting over such end whereby with each component detachably mounted on a jaw of a pliers-like applicator and the pin of the backplate inserted through the hollow stem of the first component and into the hole of the rigid spike, on a closing of the jaws of the applicator, the spike and stem of the first component is forced through the ear of an animal, and through the hole in the second component, and on an opening of the jaws of the applicator, the rigid pin and its backplate is left within the hollow stem of the first component, and the second component retained on the hollow stem and the spike on the end of the first component, the reusable backing plate with the pin being now withdrawn from the applied tag.

3,731,415

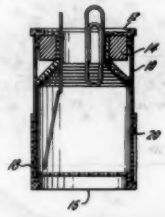
DESK APPLIANCE

Sidney X. Shore, Roslyn, N.Y., assignor to Souvenir/Inc., Cedar Rapids, Iowa

Filed Feb. 23, 1971, Ser. No. 118,018

Int. Cl. B43m *17/00*

U.S. Cl. 40—358 1 Claim



A desk appliance of elemental simplicity incorporates a magnetic paper clip dispenser having a cylindrical lateral wall and an annular magnet at the top for holding paper clips in readiness for use. The bottom of the container is removable for refilling the container, and the same bottom has an integral cylindrical extension telescopically disposed over the cylindrical wall of the container. The extension is a mask or frame that exposes a selected group of seven columns of numerals out of thirteen columns of day-of-the-month numerals, and over the seven selected columns the mask has seven day-of-the-week

characters. The bottom of the container and its extension forms a unit that is rotatable, thereby to provide a perpetual calendar.

3,731,416

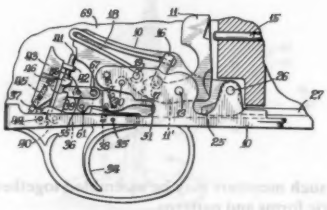
GUN MECHANISM WITH DISABLING SEAR

Harry F. Semple, 998 Leahy Circle East, Des Plaines, Ill.

Filed Feb. 1, 1971, Ser. No. 111,570

Int. Cl. F41c *19/00*

U.S. Cl. 42—42 R **2 Claims**



A double-barrel shotgun has two hammers operated by a single trigger. The operating mechanism includes a sear for each hammer. When the gun is cocked a first pull of the trigger always operates one of the sears to release a corresponding hammer and a second pull of the trigger operates the second sear to release the second hammer. The one sear is in two parts pivotally connected and lockable in two alternative positions, one of which renders the sear ineffective and in the other of which the sear is effective.

3,731,417

FIREARMS

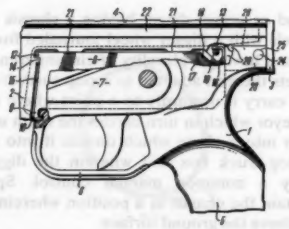
Tilo Moller, Oberndorf, and Dieter Ketterer, Oberndorf, (Neckar), both of Germany, assignors to Heckler & Koch GmbH, Oberndorf/Neckar, Germany

Filed May 12, 1971, Ser. No. 142,607

Claims priority, application Germany, May 14, 1970, P 20 23 545.4

Int. Cl. F41c *27/00*

U.S. Cl. 42—75 C **7 Claims**



An automatic hand firearm includes a unit comprising a trigger box and a hand grip which are in mutual engagement in the firearm casing by hook and pin engagement means, such engagement being maintained by a projecting part of the shoulder support, the latter being held by means of a detachable pin and on removal the shoulder support releases the unit which can then be withdrawn with a rearward disengagement movement.

3,731,418

SMALL FIREARMS WITH EXCHANGEABLE BARREL

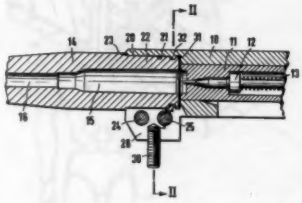
Manfred Birkenhagen, Eckernforde, Germany, and Manfred Birkenaen, Eckernforde, Germany, assignors to J. P. Sauer & Sohn GmbH, Eckernforde, Germany

Filed March 22, 1971, Ser. No. 126,441

Claims priority, application Germany, Nov. 25, 1970, P 20 57 995.7

Int. Cl. F41c *21/00, 23/00*

U.S. Cl. 42—75 B **12 Claims**



An apparatus for detachably securing a firearm barrel with a receiver flange of a receiver assembly and characterized in that the receiver flange is longitudinally slit so as to permit the flange to be circumferentially constricted into clamping engagement with the barrel.

3,731,419

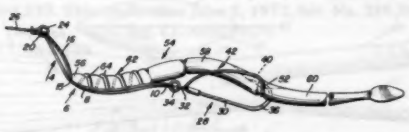
HEADER-SPOON WITH FLEXIBLE TRAILING BAIT

William R. Candy, R.D. No. 3 Upper Terrace Street, Montpelier, Vt.

Filed Aug. 27, 1971, Ser. No. 175,610

Int. Cl. A01k *85/00*

U.S. Cl. 43—42.28 **4 Claims**



An anti-fouling fishing lure for use in any normal aquatic environment characterized, generally stated, by a one piece spoon, a fishhook hingedly linked to the tail portion of the spoon, and a trailing bait having forward and median portions connected to featured portions of the spoon and hook, respectively. The hook embodies a novelly constructed resilient-type weed guard. The trailing bait comprises a suitable bait (usually a plastic worm) of requisite length and cross-section. The self-contained facilities permit the worm to be rigged on the spoon and hook in a manner which assures weight and balance and makes for easy casting without encountering exasperating fouling on the cast, troll or retrieve.

3,731,420

DOLL SWING CARRYING CASE

Dorland L. Crosman, Glen Ridge, N.J., assignor to Remco Industries, Inc., Harrison, N.J.

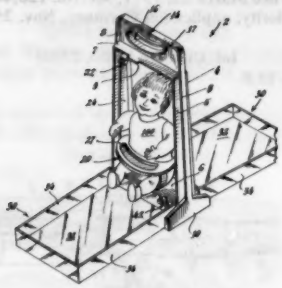
Filed May 31, 1972, Ser. No. 258,439

Int. Cl. A63h *33/00*

U.S. Cl. 46—1 R **5 Claims**

A light-weight toy swing carrying case having hinged covers which are positionable from their closed location to an open

placement where they serve as counterbalances and maintain the upright swing stable preventing it from tipping during swing motion. The swing case is a container for the swing and any toy figure seated therein and may be conveniently carried by a handle stored in place by stacking.



3,731,421

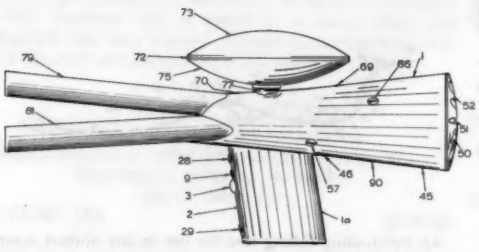
DEVICE FOR SCATTERING LIGHT OBJECTS

Domenico Frattolillo, and Anthony Frattolillo, both of 1555 Jane St., Apt. 1015, Weston-Toronto, Ontario, Canada

Filed April 12, 1971, Ser. No. 133,335

Int. Cl. A63h *33/26*

U.S. Cl. 46—10 **10 Claims**



A device for scattering light objects such as confetti, in which the objects fall through an aperture from a container into a housing and are blown out through one or more forwardly projecting barrels by a fan located behind a screen located rearwardly of the aperture.

3,731,422

ELEMENTS HAVING ALTERNATING MUTUALLY PERPENDICULAR FORMATIONS PERMITTING INTERFITTING

Norman T. McFarland, Urbana, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 10, 1971, Ser. No. 114,148

Int. Cl. A63h *33/08*

U.S. Cl. 46—28 **4 Claims**

A construction hobby set of a plurality of identical interfitting members, each member being generally elongate and stick-like in nature with alternate transversely arranged portions designed to matingly engage with each other so that several such members may be assembled together in different geometric forms and patterns.

3,731,423

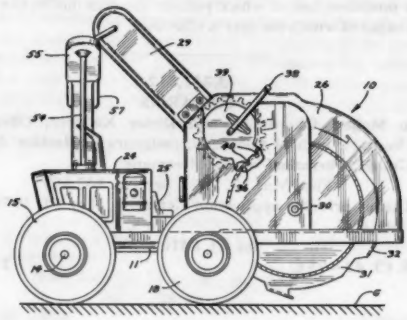
TOY ROTARY DIGGER AND CONVEYOR

Gerald A. Cuhel, Glencoe, Minn., assignor to Tonka Corporation, Minneapolis, Minn.

Filed March 15, 1972, Ser. No. 234,903

Int. Cl. A63h *33/30*

U.S. Cl. 46—40 **3 Claims**



A toy sand or gravel digger having a chassis mounted on ground wheels with a digger wheel journaled for rotation on the chassis and having a plurality of circumferentially spaced scoop buckets thereon adapted to scoop earth from a ground surface and carry it upwardly to a point where it is dumped onto a conveyor which in turn carries the earth upwardly and discharges it into a chute which directs it into a receptacle such as a toy truck box and wherein the digger wheel is operated by a common manual control. Spring means yieldably retain the chassis in a position wherein the buckets are spaced above the ground surface.

3,731,424

TOY AIRCRAFT AND CONTROL THEREFOR

Burton C. Meyer, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

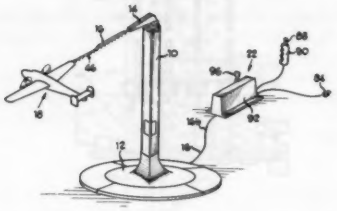
Filed Oct. 28, 1971, Ser. No. 193,388

Int. Cl. A63h

U.S. Cl. 46—77 **25 Claims**

An amusement device which includes a craft, such as a model airplane, attached by a power cable and a tethering line to a control means which includes an upright generally hollow

support pylon for tethered "flying" of the craft about the pylon. The tethering line is threaded for free movement through the hollow pylon, extends from the top thereof for connection to the craft, and extends from the bottom thereof for manipulation whereby the flight of the craft may be controlled simply by pulling in or paying out the tethering line. In one embodiment of the invention a motor in the craft is connected through the power cable to battery type power means in the pylon. A switch for the power means is operatively associated with the tethering line and is actuated as a function of the amount of tension in the line. The motor is removably



mounted in a recess on the exterior of the craft and a power plug is connected to the end of the power cable and is removably received in a socket on the craft. A reel type assembly is provided for paying out and reeling in the tethering line. The assembly has a single lever and control handle arrangement for controlling both the speed of the craft motor and the paying out and reeling in of the tethering line. Lost motion means is provided in the connection between the lever and the reel to prevent entanglement of the line on the reel during rapid paying out of the line. The reel itself has a double core to provide space between the cores for excess tethering line to further prevent entanglement thereof on the reel.

3,731,425

HOOP ROLLER GAME APPARATUS

Willie L. Streeter, 2121 H Street, N.W., Washington, D.C.

Filed Oct. 29, 1971, Ser. No. 193,859

Int. Cl. A63h *33/02*

U.S. Cl. 46—220 **2 Claims**

Apparatus for the playing of a game is disclosed. The apparatus includes a ring member and an elongated rod for controlling the ring so that the ring may be rolled along the ground or other suitable surface. The end of the rod which engages the ring is formed in the shape of a notch for the purpose of providing an enclosure, open on one side, into which the ring may be fitted. The rod provides a means of controlling both the speed and direction of rotation of the ring member. A brake may be attached to the ring member for actuation by the rod when it is desired to stop the motion of the ring.

3,731,426

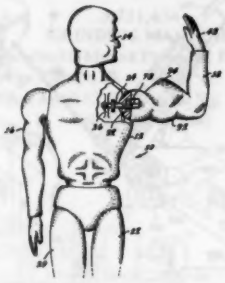
SHAPE-CHANGING FIGURE TOY

J. Stephen Lewis, Pacific Palisades; John T. Benson, Encino; Denis V. Bosley, Palso Verdes Penninsula, and Jurgis Sapkus, Manhattan Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 12, 1971, Ser. No. 188,403

Int. Cl. A63h *33/00*

U.S. Cl. 46—119 **11 Claims**



A figure toy has a skeleton-like body member, such as an armature, covered with a flexible covering material beneath which a mechanical shape-changing mechanism is movably mounted for movement from a normal position to a material-bulging position where the shape of a selected area, such as a simulated bicep, is changed from a first condition to a second, bulged condition.

3,731,427

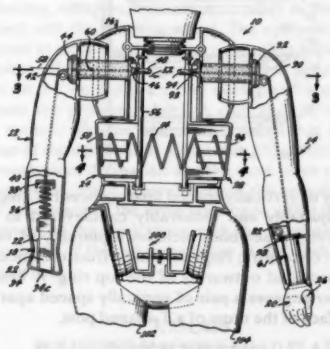
OBJECT-HOLDING HANDS FOR DOLLS

J. Stephen Lewis, Pacific Palisades; Jurgis Sapkus, Manhattan Beach, and Armando P. Villasana, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 163,202, July 16, 1971, Pat. No. 3,696,553. This application June 5, 1972, Ser. No. 259,999

Int. Cl. A63l *33/26*

U.S. Cl. 46—239 **7 Claims**

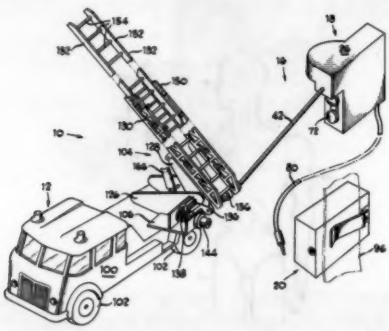


A doll which can be operated to hold and release objects when a child depresses a lever in the doll body, one of the doll hands including a magnet that can slide therein to magnetically attract and release objects. The doll is especially entertaining when used with accessories of the type found in a supermarket, one accessory being a price tag constructed of magnetically attractable material and attached to a toy package, to enable the doll to magnetically hold and release the package.

3,731,428
REMOTELY POWERED TOY SET

Marvin I. Glass, Chicago; Howard J. Morrison, Highland Park, and Donald F. Nix, Des Plaines, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 9, 1971, Ser. No. 170,105
Int. Cl. A63h *33/26*
U.S. Cl. 46—243 LV **10 Claims**

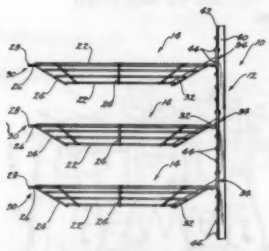


A combination toy vehicle and accessories for use therewith and drive means for the vehicles and accessories. The vehicles have auxiliary implements associated with drive transfer means and the accessories also have drivable elements associated with drive transfer means, with the drive means being separate and external to the vehicles and accessories and including a driven output shaft for engagement with the drive transfer means.

3,731,429
TOMATO VINE SUPPORT

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing Inc., Lexington, Nebr.

Filed Dec. 16, 1970, Ser. No. 98,687
Int. Cl. A01g *17/14*
U.S. Cl. 47—47 **9 Claims**

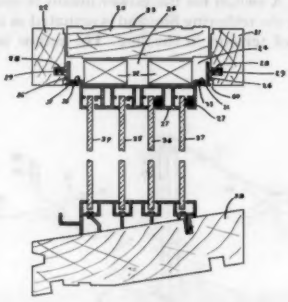


A plurality of vertically spaced apart concentric ring assemblies are adjustably and removably cantilevered to a post. Each of the ring assemblies includes a plurality of vertically spaced apart concentric rings defining a frustro conical shape. A ledge is provided outwardly of the top ring. A bracket on the cantilever engages a pair of vertically spaced apart shoulders on the face of the cross of a T-shaped post.

3,731,430
WINDOW UNIT

Dominique Dallaire, and Raymond Dallaire, both of St. David, Quebec, Canada, assignors to P. H. Plastics Inc., Lanzon, Quebec, Canada

Filed Jan. 13, 1971, Ser. No. 106,203
Int. Cl. E06b *1/04*
U.S. Cl. 49—419 **6 Claims**



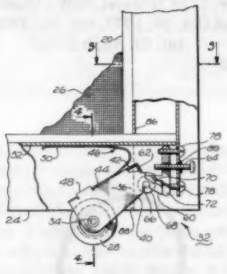
In a single or double glazed horizontal or vertical sliding type window unit, a removable header or jamb track structure is disclosed wherein detent means having a plurality of outwardly projecting serrations which are inserted into grooves located in the flanges of a channel-shaped window frame member to retain by means of a lip the movable pane receiving members within the opening in the channel-shaped window frame. The window frame and the detent means are also adapted to receive moulded window frame coverings.

The movable pane receiving members used in the header of an horizontal sliding type window unit are interchangeable with the movable pane receiving member used in the jamb of a vertical type window unit and vice versa.

3,731,431
SLIDING-DOOR CORNER JUNCTION AND SUPPORT STRUCTURE

Joseph Banner, Whittier, Calif., assignor to Anjac Mfg. Co., Inc., El Monte, Calif.

Filed Sept. 24, 1971, Ser. No. 183,485
Int. Cl. E05d *13/02*
U.S. Cl. 49—420 **2 Claims**

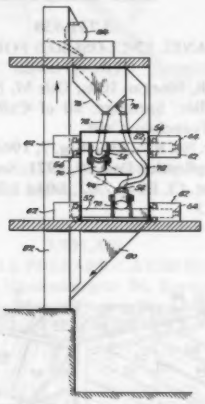


A sliding-door structure is disclosed incorporating a corner device which affixes linear frame members together in a lapped corner joint and further provides a spring-biased threshold-engaging roller, the "stop" or loaded position of which is adjustable as a result of a screw member that is accessible at the stile of the door. A corner block matingly engages transverse apertures in a frame rail and is affixed, as by screws, to the lapping end of a stile. The block also provides a pivot post for a carrier which in turn supports a roller. The carrier is affixed to a spring for maintaining the roller engaged with a threshold rail, and an adjustment is provided through the block by a screw which abuts the carrier.

3,731,432
APPARATUS FOR REMOVING WUSTITE SCALE CENTRIFUGAL BLASTING

James H. Carpenter, Jr., and Don B. Nalley, both of Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 46,961, June 17, 1970, abandoned. This application Jan. 5, 1972, Ser. No. 215,616
Int. Cl. B24c *3/14*
U.S. Cl. 51—9 15 Claims

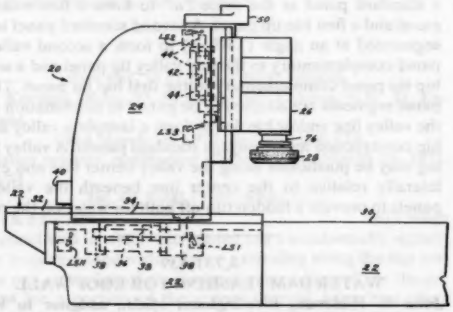


Wustite scale is removed from iron or steel products by blasting fine grit from a centrifugal blast wheel which rotates at low speed, against the product at an angle thereto with the grit having sharp edges.

3,731,433
APPARATUS FOR GRINDING TOOTHED FACED MEMBERS

James F. Clarke, and Thomas A. Deprez, both of Rochester, N.Y., assignors to The Gleason Works, Rochester, N.Y.

Division of Ser. No. 803,683, March 3, 1969, Pat. No. 3,640,030. This application Nov. 17, 1970, Ser. No. 90,440
Int. Cl. B24b *19/00*
U.S. Cl. 51—34 K 13 Claims



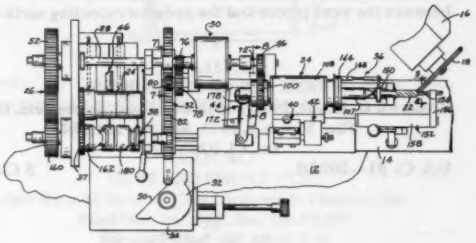
The present invention includes provision of the use of an adaptive gauging process in connection with tooth slot forming operations wherein a gauge probe from a control system is inserted into a tooth slot that is already cut, and any deviations from the proper tooth size, as indicated by the reading taken by the probe, will be taken into account in connection with cutting the next tooth slot. Thus, the feeding movements between the tool and workpiece will be modified through the control system under the control of the gauging probe after the latter takes a reading of the size of the previously cut tooth slot. Also, a precision, intermittently operating work indexing mechanism utilizing a control system is provided for operating in conjunction with the gauging probe to further improve the precision of the finished product.

The present invention further comprises an orientation of machine parts wherein the work table is arranged to mount a workpiece for rotary movement about a vertical axis, and the grinding wheel is adjustably carried above the workpiece, and for rotation about a vertical axis.

3,731,434
GRINDING MACHINE

Gerhard E. Karwinski, Mount Prospect, Ill., assignor to CTR, Inc., Elk Grove Village, Ill.

Filed April 12, 1971, Ser. No. 133,224
Int. Cl. B24b *3/26*
U.S. Cl. 51—95 LH 20 Claims



A grinding machine for forming a helical cutting surface on a tool, especially a tool such as a stepped twist drill. The grinding machine generally includes a rotary grinding wheel, which grinding wheel is fixedly positioned relative to a frame, and a table movably mounted on the frame adjacent to the grinding wheel. A power source rotatably drives a drive shaft mounted on the table. The power source is connected through the drive shaft to an epicyclic-gear train also mounted on the table. A drive housing is pivotedly mounted on the table, with a work piece drive shaft slideably and rotatably mounted in the drive housing. The work piece drive shaft is driven by the epicyclic-gear train. Connected to the work piece drive shaft is a work piece holder, which supports a work piece in position for engagement with the grinding wheel. The epicyclic-gear train is connected to a control device for controlling movement of the work piece relative to the grinding wheel to generate a helical surface on the work piece as the work piece is carried by the table past the grinding wheel. A cam shaft is driven by the power source, and the cam shaft's rotation is synchronized with that of the drive shaft. A first cam affects axial movement of the work piece drive shaft and the work piece relative to the grinding wheel, and a second cam on the cam shaft regulates pivotal movement of the drive housing to affect the peripheral engagement of the work piece with the grinding wheel to affect the depth of the cut to be taken in the work piece by the grinding wheel.

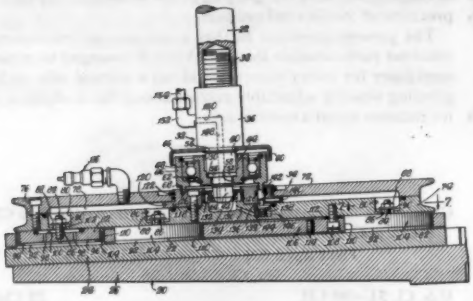
3,731,435
POLISHING MACHINE LOAD PLATE

Stephen A. Boettcher, Deerfield; Joseph V. Cesna, Niles, and Raymond E. Dumentat, Roselle, all of Ill., assignors to Speedfam Corporation, Des Plaines, Ill.

Filed Feb. 9, 1971, Ser. No. 114,023
Int. Cl. B24b *7/04*
U.S. Cl. 51—129 19 Claims

A load plate having depending pedestals with vacuum passage means communicating with the lower surfaces of the pedestals, and valve means for effecting a negative pressure on work pieces mounted on the pedestals for retaining the work

pieces thereon during finishing. A mask plate establishes work piece receiving pockets with the pedestals, and sealing means



maintain the negative pressure mounting and prevent leakage between the work pieces and the pedestal mounting surfaces.

3,731,436

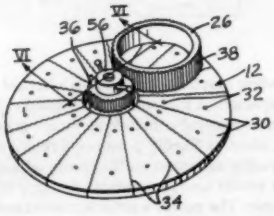
FREE ABRASIVE MACHINE

Frederick G. Krafft, 2975 Fox Hollow Road, Springfield, Ohio

Filed March 5, 1971, Ser. No. 121,264

Int. Cl. B24b *7/04*

U.S. Cl. 51—209 DL **5 Claims**



A free abrasive machine in which the rotary back up wheel has the gaps between adjacent sectors thereof which are non-linear. The rings resting on the wheel have external teeth and a pinion gear on the axis of the wheel meshes with the teeth. A tooth type coupling between the back up wheel and the pinion gear selectively couples the pinion gear selectively couples the pinion gear to the wheel or releases it therefrom.

3,731,437

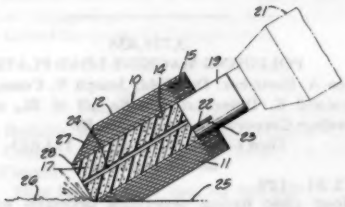
ROTARY ABRASIVE TOOL

Joseph R. Ewell, 471 West Montocito Avenue, Sierra Madre, Calif.

Continuation-in-part of Ser. No. 68,407, Aug. 31, 1970, abandoned. This application June 30, 1971, Ser. No. 158,419

Int. Cl. B24d *17/00*

U.S. Cl. 51—361 **15 Claims**



A rotary abrasive tool employs a spiral-wound abrasive strip having successive wraps bonded together at least at one end by an adhesive to form a tube of generally cylindrical shape. A short driver is fixed by adhesive at one end of the tube and a portion thereof may project a short distance into the tube. The tube may also comprise a plurality of short length tubular segments having adhesive material on each end face and bonded together end-to-end. The hollow center of the tube may be filled with friable material bonded to the inner surface of the tube to provide an abrasive core, and also to provide the inner wrap of the tube with self-trimming capability when the tube is rotated in oblique frontal contact with a work piece.

3,731,438

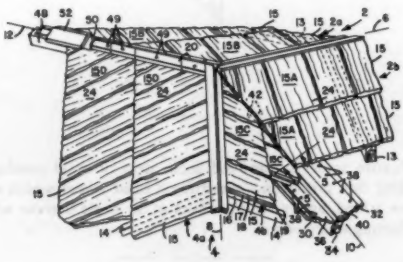
BUILDING PANEL ENCLOSURES FOR VALLEY AND HIP STRUCTURES

John K. Kough, Morgan Hills; Otis M. Martin, San Jose, and Silas N. Miller, Saratoga, all of Calif., assignors to Ditz-Crave, San Francisco, Calif.

Division of Ser. No. 856,235, Aug. 7, 1969, Pat. No. 3,696,570. This application Dec. 20, 1971, Ser. No. 210,039

Int. Cl. E04b *7/02*; **E04d** *1/20, 13/00*

U.S. Cl. 52—13 **3 Claims**



Prefabricated enclosure tip panels and a method of manufacturing the tip panels for enclosing valley and/or hip areas. The tip panel at one longitudinal end is beveled at an angle "*a*" which angle is dependent upon the relative angle between the two sections at the valley and/or hip joint. The other longitudinal end is adapted for interengagement with a standard panel. A method of manufacturing the tips include segmenting a standard panel at the angle "*a*" to form a first valley tip panel and a first hip tip panel. A second standard panel is then segmented at an angle ($180°-a$) to form a second valley tip panel complementary to the first valley tip panel and a second hip tip panel complementary to the first hip tip panel. The tip panel segments are adapted to be joined in combination along the valley line and/or hip line to form a complete valley and/or hip construction and to engage standard panels. A valley flashing may be positioned along the valley center line and extend laterally relative to the center line beneath the valley tip panels to provide a hidden run-off path for water on the roof.

3,731,439

WATER DAM FLASHING FOR ROOF WALL

John B. Hickman, Birmingham, Mich., assignor to W. P. Hickman Company, Inc., Troy, Mich.

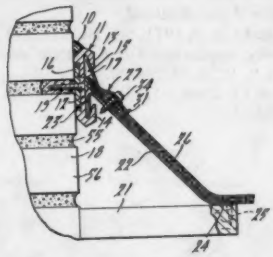
Filed April 19, 1971, Ser. No. 135,079

Int. Cl. E04d *13/14, 13/15*

U.S. Cl. 52—61 **7 Claims**

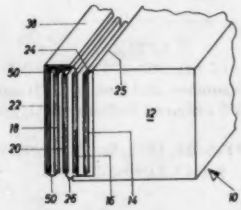
A reglet is constructed to be supported on the inner face of a parapet, firewall or the like which extends above the roof deck of a building. The reglet is an extrusion or a formed strip having supporting means by which it is sealed to the face of the parapet or wall. The reglet is positioned a predetermined distance from the roof deck so that it can support a cant on which the marginal portions of the roof material can be sup-

ported. A flashing strip is then secured to the material and cant by screws which apply pressure to the flashing strip to



secure the roofing material to the cant and provides a seal with the inner surface of the reglet.

3,731,440
COLLAPSIBLE PREFABRICATED BUILDING
Hans-Joachim Welz, Hindenburgstr. 56, Korntal, Germany
Filed April 13, 1971, Ser. No. 133,626
Int. Cl. E04b *1/343*
U.S. Cl. 52—71 **16 Claims**



A collapsible prefabricated building is composed of walls some or all of which may be made up of plate sections connected by ropes or hinges in such a manner that they can be folded together to make a package composed of the superimposed stacked plate sections, with the building being erectable simply by folding the plates apart and having them assume their predetermined relative positions.

3,731,441
FACING WALLS OF BUILDINGS
Jack Kenneth Dixon, 23, Dunstan road, London, N.W. 11, England
Filed March 15, 1972, Ser. No. 234,773
Claims priority, application Great Britain, March 16, 1971, 7038/71
Int. Cl. E04f *13/08;* **E04c** *2/22*
U.S. Cl. 52—204 **20 Claims**

A panel wall in which each panel has a substantially rectangular body provided with a flange extending along the top and down one side edge of the body, the front face of the flange, except for a portion of the corner thereof, lying in a plane through the rear edge of the body of the panel and the corner portion being set back rearwardly so that its front face lies in a plane through the rear face of the remainder of the flange. Each panel comprises a shell moulded in glass fiber reinforced polyester and fitted with an internal frame of wood or alternatively filled with concrete. The panels are arranged in a regular formation aligned horizontally and vertically with the body of each panel overlapping the flanges of adjacent panels. At the corner junction between four contiguous panels, the end of the flange on the lower right panel overlaps part of the corner portion of the lower left panel, the end of the flange on the upper left panel overlaps another part of the corner portion of the lower left panel, and the body of the upper right panel overlaps the flanges on the lower right and upper left panels including the ends thereof which overlap parts of the corner portion of the lower left panel. The panels are secured

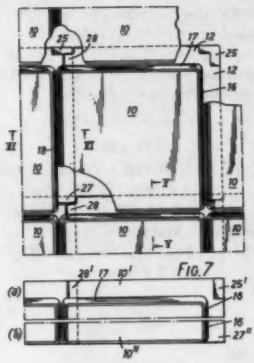
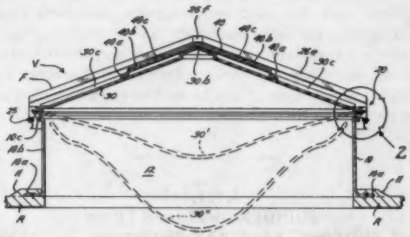


FIG. 7

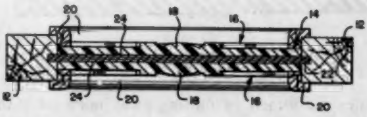
together by bolts extending through the flange and overlapping body of each pair of adjacent panels.

3,731,442
HEAT AND SMOKE VENT
Sandow Kiyoshi, Houston, Tex., assignor to Plasteco, Inc.
Filed Oct. 28, 1970, Ser. No. 84,577
Int. Cl. E04c *2/02;* **E04d** *1/30*
U.S. Cl. 52—232 **9 Claims**



A heat and smoke vent for the roof of a building or other structure having a cover which deforms and disengages from its mounting when heated by a fire in the building notwithstanding rain falling thereon, and thereby automatically releasing the heat and smoke from the building.

3,731,443
CARVED DOORS
Fred E. Zaroor, Muskogee, Okla., assignor to Indian Capitol Plastics, Inc., Muskogee, Okla.
Filed Dec. 29, 1971, Ser. No. 213,356
Int. Cl. E06b *3/70*
U.S. Cl. 52—309 **10 Claims**



Methods are provided for economically producing doors having decorative carvings thereon. After selecting a prefabricated wooden door frame with one or more openings therein for receiving decorative carved panels, which openings have disposed therein thin plywood panels providing

decorative panel insert areas, "carved" panels of polyurethane structural foam are formed by injection molding expandable plastic into a mold of a configuration of the final "carved" design. The formed foamed panels are subsequently adhered to one or both sides of the surfaces of the plywood panels. Subsequently, the combined wood-polyurethane doors are specially treated to provide an integrated, "all wood" appearing door having appropriately configured carvings disposed on the surface thereof. Also, disclosed herein are the new doors produced by the new methods.

3,731,444
RAISED PANEL DOOR AND METHOD OF MANUFACTURE

Robert O. Tobin, Marshfield, Mass., assignor to Frank W. Woodman, Marshfield, Mass.

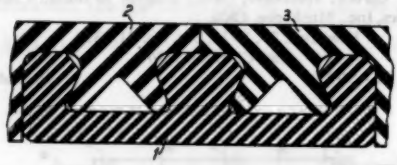
Filed March 24, 1972, Ser. No. 237,750
Int. Cl. E06b *3/70*
U.S. Cl. 52—316 **11 Claims**

A raised panel door has a center panel surrounded by four inner border members which in turn are surrounded by four outer border members. Said panel and border members have a plastic face sheet and a relatively thick backer of inexpensive material. The said center panel is rabbeted around its periphery, and the four inner border members taper in thickness from the latter outwardly, the thicker edge portions extending into the center panel rabbets and the thinner edge portions extending into rabbets formed in the outer border members. A flat support is attached to the assembled center panel and said border members, forming a unitary whole.

3,731,445
JOINDER OF FLOOR TILES

Rudolf Hoffmann, Laudenbach/Bergstrasse, and Wolfgang Winkler, Mannheim, both of Germany, assignors to Carl Freudenberg, Postfach, Germany

Filed Aug. 3, 1970, Ser. No. 60,232
Claims priority, application Germany, May 2, 1970, P 20 21 503.6
Int. Cl. E04f *13/08*
U.S. Cl. 52—391 **2 Claims**

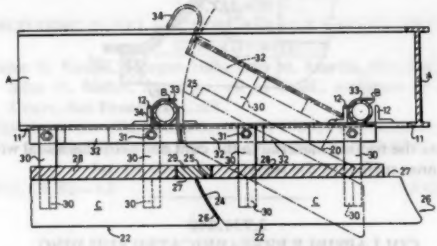


Floor tiles are joined by cutting away material along the edges so as to leave undercut projections extending downwardly from the bottom of the tiles. Joining of tiles is effected by using a strip provided with a pair of parallel channels into which extend the projections from two different tiles. The undercut configurations prevent the tiles from being removed by a simple vertical pull.

3,731,446
ROOF AND WALL STRUCTURES MORE PARTICULARLY OF HEAT ENCLOSURES

Robert Wallace, North Wales, England, assignor to Rotablock Limited, North Wales, England

Filed Feb. 5, 1971, Ser. No. 112,912
Claims priority, application Great Britain, April 28, 1970, 20,238/70; Oct. 9, 1970, 48,196/70
Int. Cl. E04b *5/57*; F27d *1/02, 1/08*
U.S. Cl. 52—486 **5 Claims**

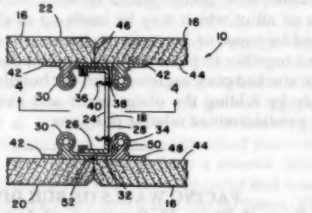


The present invention relates more particularly to furnace enclosures and provides a suspended roof or wall system, and blocks therefor, which permits of the pivoting of individual blocks of the system into and out of installed position without disturbing fellow blocks.

3,731,447
WALLBOARD ATTACHMENT

Jack A. Dawdy, Kenmore, and Donald G. Hamme, Tonawanda, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,295
Int. Cl. E04b *2/28, 2/76*
U.S. Cl. 52—489 **10 Claims**



An elongate rigid plastic extrusion, adhered to the back face of gypsum wallboard along the vertical edges, with an elongate tubular portion, projecting rearwardly, lockingly engaged in a plurality of spring clips which are clipped onto the two opposite faces of a steel stud.

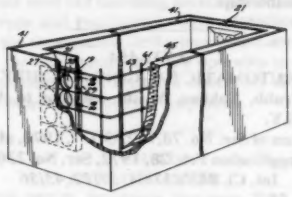
3,731,448
DUCT TERMINATOR

Herbert S. Leo, Los Angeles, Calif., assignor to Formex Manufacturing, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 853,727, Aug. 28, 1969, abandoned. This application Dec. 3, 1971, Ser. No. 204,426
Int. Cl. E04c *1/39*; E04f *17/08*
U.S. Cl. 52—594 **15 Claims**

A duct terminator for use in the concrete wall of an underground vault, or the like, for housing electrical equipment, such terminator including a pair of barrier walls spaced apart at a distance substantially corresponding to the thickness of the concrete wall. A plurality of spaced receptacles extend between the barrier walls to form through passages for receipt

of the extremities of a plurality of respective ducts whereby the terminator may be positioned in the concrete form for the vault wall and concrete poured thereinto to provide a plurality of spaced passages in the vault wall for receipt of the extremities of such ducts. The terminator may be made in modular form and may be formed with interlocking flanges whereby a plurality of modules may be assembled for forming a composite receptacle pattern of any desired configuration.



3,731,449

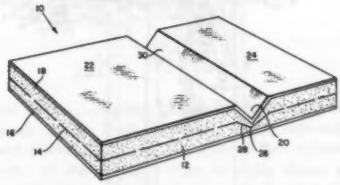
STRUCTURAL PANEL

Jonn W. Kephart, Jr., 1115 Norsam Road, Gladwyne, Pa.

Filed June 8, 1971, Ser. No. 151,113

Int. Cl. E04c *2/18, 2/40*

U.S. Cl. 52—631 **2 Claims**



A structural panel is provided with a core comprising a thick layer of urethane foam. The core is reinforced by a sheet of metal wire fabric embedded in and effectively bonded to the urethane foam whereby to reinforce the same. Lining each of the oppositely facing surfaces of the core is a urethane sheet also bonded to the urethane foam. Extending into one surface of the panel and along one edge thereof is a wide angle, V-shaped groove of a depth sufficient to sharply reduce the thickness of the core to a thickness approximately corresponding to that of said metal wire fabric, whereby the panel is divided into main body and flange parts interconnected by a hinge formation consisting of the area of said wire fabric embedded in the area of said core sharply reduced in thickness by said groove, and of the associated areas of said sheets of urethane.

3,731,450

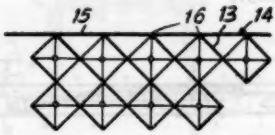
METAL STRUCTURE AND SECTIONS

Stephane Du Chateau, 180, rue de la Porte Jaune, 92 Saint-Cloud, France

Filed Aug. 14, 1969, Ser. No. 850,022

Int. Cl. E04h *12/08*

U.S. Cl. 52—648 **2 Claims**



The method of assemblying pyramid elements in order to obtain a metallic space structure consists in joining the truncated corners of the basic frames of the pyramid elements, these frames being regular polygones, each joint being effected by means of one single bolt.

3,731,451

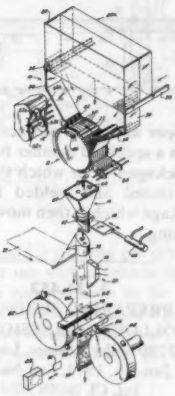
FILTER PLUG FORMING AND BAGGING MACHINE

John H. Sexstone, Middletown, and Wolfgang H. Grimm, Louisville, both of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed June 2, 1971, Ser. No. 149,177

Int. Cl. B65b *19/34*

U.S. Cl. 53—23 **17 Claims**



Filter rods of predetermined length are placed in a hopper and fed to a slitting drum. This drum contains flutes divided into four groups, two of which are separated and their flutes are open whereas the other two groups of flutes are closed. The rods are received in the open flutes and there they are cut by a series of rotary knives into equal sections to provide filter plugs. The adjacent group of closed flutes in the path of rotary travel of the drum permits the cut filter plugs to be directed to a bagging station at which they are enclosed in a bag before the next group of cut filter plugs are permitted to pass through to the bagging station. As the cut filter plugs leave the slitting drum, they are directed into a funnel which has associated therewith a gate. The gate closes off the base of the funnel until the preceding group of cut filter plugs are completely enclosed in a bag. Thereafter, the hate is opened to permit the collected plugs to pass through to the bagging station. At this station a web of heat sealable wrapping material is fed into a tube former which forms the wrapping material into a tube which extends vertically. A heat sealer seals the overlapped marginal side edges of the tube of wrapping material. A pair of opposed and reciprocal heat sealers operates to heat seal and close the lower end of the tube at which the group of cut plugs collect. When the predetermined number of cut filter plugs is collected, the pair of reciprocal heat sealers are reciprocated to heat seal and close the tube above the group of collected plugs. This upper heat sealed zone is cut along an intermediate section to thereby produce a severed bag of filter plugs and at the same time provides the heat sealed and closed lower end of the next bag to be formed. The filled and severed bags are then permitted to drop and be collected in a suitable receptacle.

3,731,452

PROCESS AND APPARATUS FOR CONTINUOUS PACKAGING OF PRODUCTS AND OBJECTS

Jean Claude Rias, Maisons, France, assignor to Cogar Corporation, Wappinger Falls, N.Y.

Filed Jan. 12, 1971, Ser. No. 105,931

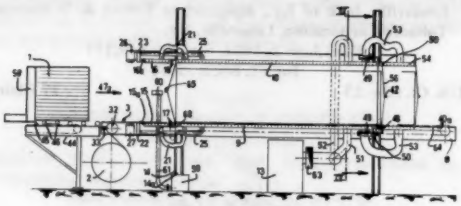
Claims priority, application France, Jan. 12, 1970, 7000974

Int. Cl. B65b *9/14, 57/12*

U.S. Cl. 53—29 **8 Claims**

A method and machine is disclosed for the continuous

packaging of products, particularly in a six-sided parallelepipedal package, employing a heat-weldable and heat-shrinkable plastic material in special tubular sheath form, which involves continuously feeding of the sheath, transversely welding the same and feeding the sheath in flat condition a specified distance. Principal sections of the apparatus apply



vacuum to the upper and lower surfaces of the flat sheath to open the sheath in a specified manner for the reception of the products to be packaged, after which the open end of the tubular sheath is closed and welded by special means to complete the package which is then moved out of the machine for shrinkage heating.

3,731,453

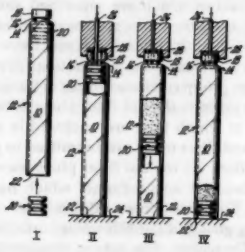
METHOD FOR PREPARING SYRINGE TYPE VIALS OF HYDROCOLLOID IMPRESSION MATERIAL

Don D. Porteous, 3780 Selby Avenue, Los Angeles, Calif.

Filed Jan. 26, 1971, Ser. No. 109,771

Int. Cl. B65b *3/04*

U.S. Cl. 53—37 **4 Claims**



A method is provided for preparing an enclosed vial of reversible hydrocolloid dental impression material which includes the step of positioning a stopper a sufficient distance within the vial to permit expansion of the impression material upon subsequent heating of the vial without ejecting the stopper from the vial. The vial, which may take the form of an open ended tube having an enlarged portion terminating at one end in shoulder, neck and rim portions, is initially loaded by a multi-step process which includes (*a*) inserting a stopper through the enlarged portion until it engages The shoulder portion, (*b*) placing the open end of the enlarged portion in abutment with a substantially flat surface and (*c*) filling the vial through the rim and neck portions with hydrocolloid under sufficient pressure to move the stopper through the enlarged portion and into abutment with the substantially flat surface.

In a second embodiment, the aforementioned vial is initially loaded by a multi-step process which includes (*a*) inserting a stopper into the enlarged portion until the rearward end of the stopper is substantially aligned with the lip of the enlarged portion, (*b*) placing the closed end of the enlarged portion in abutment with a substantially flat surface, (*c*) inserting a filling tip through the rim portion until it is in juxtaposition to the stopper and (*d*) filling the vial through the filling tip while simultaneously withdrawing the filling tip from the vial. After the vial is filled with hydrocolloid impression material, the stopper is moved into the vial a sufficient distance to accommodate expansion of the impression material when the vial is heated to 212° F. to condition the material for further use. Following this step the rim portion of the vial is closed with a needle permeable cap.

3,731,454

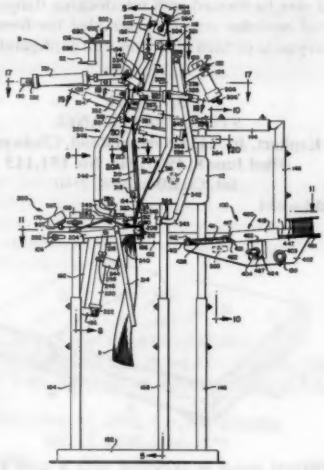
AUTOMATIC BAGGING MACHINE

Jasper R. Crabb, Yakima, Wash., assignor to Ag-Pak Inc., Gasport, N.Y.

Continuation of Ser. No. 78,762, Oct. 7, 1970, abandoned. This application Feb. 28, 1972, Ser. No. 230,163

Int. Cl. B65b *57/04, 57/12, 43/36*

U.S. Cl. 53—55 **37 Claims**



An automatic bagging machine for produce or the like includes bag feeding, holding and tying devices and an electro-pneumatic control system for actuating and deactuating such devices in timed sequence to feed and open the bags to be filled, as well as to close and tie the filled bags. In combination with an automatic weighing machine the two machines are especially adapted to operate together and thereby form an automatic weighing and bagging system, with each machine controlling the operation of the other.

3,731,455

MOBILE MACHINE FOR DEPOSITING AND STORING USED RAIL FASTENING MEANS PARTS IN RECEPTACLES

Josef Theurer, Vienna I, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed Nov. 17, 1971, Ser. No. 199,531

Claims priority, application Austria, Dec. 17, 1970, A 11 352

Int. Cl. B65b *67/00*

U.S. Cl. 53—391 **10 Claims**

A succession of receptacles are mounted on the underside of a mobile machine frame in the direction of track elongation

for receiving and storing removed used rail fastening means parts. A conveyor band is mounted on the machine frame above the receptacles and extends in the same direction. The conveyor band has a receiving end adjacent a working station where removed used rail fastening means parts may be placed on the conveyor and two lateral edges extending above the open tops of the receptacles. Deflecting means are mounted in the range of the receptacles and are operable to contact the conveyor band surface for selective deflection of the parts on the conveyor band to respective receptacles.

3,731,456

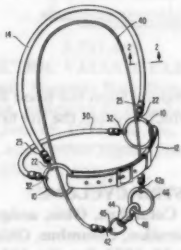
ANIMAL HALTER

Richard S. Hill, 302 W. Steadman, Sherman, Tex.

Filed May 4, 1971, Ser. No. 140,105

Int. Cl. B68b *01/02*

U.S. Cl. 54—24 **13 Claims**



An animal halter including generally cylindrical cables of small diameter made from relatively hard, self-supporting material, and extending across the pole of the animal's neck and the bridge of the animal's nose to apply direct pressure thereon for controlling or training the animal when the halter is stressed during use.

3,731,457

PROCESS FOR SCRUBBING GASES

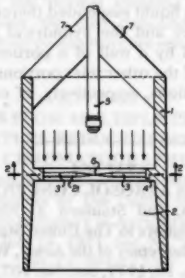
Virgilio Stocchi, Mestie; Antonio Cavraro, Porto Marghera; Carlo Morsiani, Saronno, and Dario Vio, Porto Marghera, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Division of Ser. No. 873,822, Nov. 4, 1969, Pat. No. 3,611,592. This application July 15, 1971, Ser. No. 163,032

Claims priority, application Italy, Nov. 7, 1968, 23393 A/68; Sept. 29, 1969, 22639 A/69

Int. Cl. B01d *53/00*

U.S. Cl. 55—64 **1 Claim**



Scrubbing process for separating vapors, liquid and solid particles from gas by a scrubbing liquid. A spout directs a full stream of the scrubbing liquid at a grid which comprises a multiplicity of spaced apart rods for forming films of the scrubbing liquid. The plane of the grid is transversely disposed with respect to the gas stream to be purified. The gas stream is passed through the films of scrubbing liquid for cleaning.

3,731,458

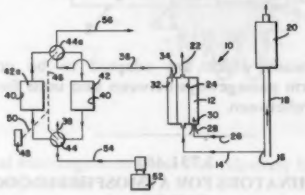
VEHICLE GAS DRYER PURGING SYSTEM AND METHOD

William F. McGrath, Jr., Pine City, N.Y., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Jan. 20, 1971, Ser. No. 108,047

Int. Cl. B01d *53/04*

U.S. Cl. 55—33 **7 Claims**



A system and method for purging gas dryers, such as compressed air dryers, for use with a vehicle in which the gas is used for the vehicle's systems, such as the air brake system. The invention heat exchanges the exhaust gases of the vehicle with the input ambient air to heat the latter, and reactivates or purges drying towers with the purge gas product resulting therefrom.

3,731,459

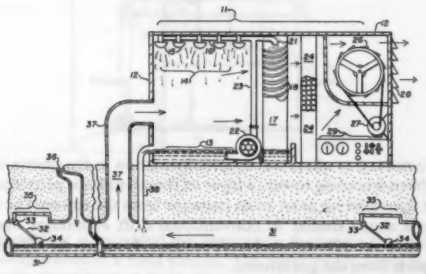
METHOD AND APPARATUS FOR TREATING POLLUTED AIR ALONG AUTO TRAFFIC ARTERIES

Chester L. Foster, 404 Nelray, Austin, Tex.

Filed Dec. 31, 1970, Ser. No. 103,060

Int. Cl. B01d *53/14*

U.S. Cl. 55—94 **5 Claims**



Method and apparatus for collecting polluted air along crowded automobile thoroughfares channeling said polluted air through unused but controlled portions of existing storm sewers used as air passageways, together with apparatus for scrubbing, washing and filtering said collected air in area air treatment plants and reciculating the purified air back to sidewalk areas along the streets affected by heavy auto traffic and air pollution.

3,731,460

REGENERATIVE FILTRATION APPARATUS

Natsuo Narumi, Kobe City, Japan, assignor to Mitsubishi Jukogko Kabushiki Kaisha, Tokyo, Japan

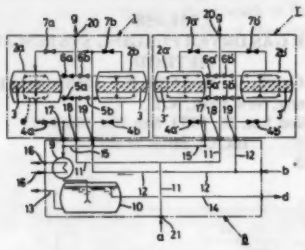
Filed Dec. 16, 1970, Ser. No. 98,590

Int. Cl. B01d *53/04*

U.S. Cl. 55—179 **5 Claims**

A regenerative filtration apparatus comprising at least one filter unit having the rein casings and valves to switch the flow

direction of a fluid to be filtered, and a regenerative unit having therein separate passageways for the fluid to be filtered and the regenerated fluid, said units being provided with com-

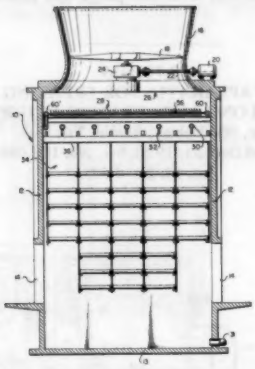


municating means which are adapted to be connected together to form passageways between said units for guiding said fluids therebetween.

3,731,461
DRIFT ELIMINATORS FOR ATMOSPHERIC COOLING TOWER

Maurice Hamon, Brussels, Belgium, assignor to Societe Hamon Sobelco S.A., Brussels, Belgium

Filed April 7, 1970, Ser. No. 26,317
Int. Cl. B01d *45/06*
U.S. Cl. 55—222 **5 Claims**



To reduce or eliminate droplet formation in the plume issuing from a cooling tower, a layer of finned tubes is provided to heat the moist air prior to its issuance from the tower. The fins have a shape similar to conventional drift eliminator blades and thus the blades, at the same time, function to eliminate droplets from the gas stream.

In addition, the above-mentioned tubes can be fitted with vertical outlet tubes or nozzles such that the finned tubes fulfill the following functions:

collect the water droplets contained in the air leaving the cooling tower;

warm up the air leaving the tower; and

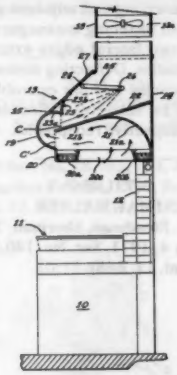
distribute the water to be cooled in the cooling tower, over the heat transfer section.

3,731,462
AIR PURIFICATION SYSTEMS

Nino F. Costarella, and Anthony A. Giuffre, both of Milwaukee, Wis., assignors to Nino's, Inc., Milwaukee, Wis.

Division of Ser. No. 839,383, July 7, 1969, Pat. No. 3,628,311. This application Sept. 30, 1971, Ser. No. 185,202
Int. Cl. B01d *47/06*
U.S. Cl. 55—228 **6 Claims**

A ventilating hood and duct structure for stoves wherein a baffle and water spray arrangement within the hood forces the smoke to pass through successive water curtains. Grease and

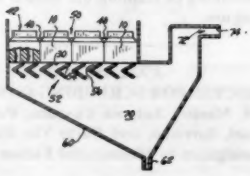


other impurities are drained from the hood structure through a rectangular trough which overlies the fire area.

3,731,463
STRIP CYCLONE

Christian Doerschlag, Columbus, Ohio, assignor to American Van Tongeren Corporation, Columbus, Ohio

Filed Sept. 20, 1971, Ser. No. 181,804
Int. Cl. B01d *47/06*
U.S. Cl. 55—238 **6 Claims**



This invention relates to a strip cyclone configuration. Each strip comprises a plurality of chambers within an integral strip medium. Each of the chambers comprises a substantially cylindrical portion. Each of the cylindrical portions in each chamber is parallel with the cylindrical portion of each of the other chambers. Each chamber has a snail-like helical portion for inlet of gas having liquid suspended therein. The inlet portion of each chamber and the cylindrical portion of each chamber is separated by a wall of a portion of the integral medium from each of the other inlet portions and each of the other cylindrical portions, respectively, of each of the other chambers.

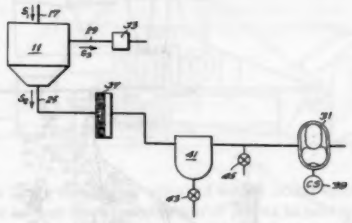
3,731,464
CONTINUOUS AEROSOL CONCENTRATOR

Allen D. Brumbaugh, and Stanford A. Mumford, both of Frederick, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1971, Ser. No. 107,765
Int. Cl. B01d *45/06*
U.S. Cl. 55—270 **1 Claim**

An airborne particle monitoring device comprising a housing suitably contoured to form a chamber, inlet, outlet and exhaust means connecting with said chamber. In operation, a vacuum power source is applied to the outlet and exhaust

means to conduct a particle containing air stream into the chamber where it is suspended and concentrated in a stream



of stagnant air. A second stream of air conducts the concentrated particles to a suitable collection device.

3,731,465

ELECTRIC VACUUM CLEANER

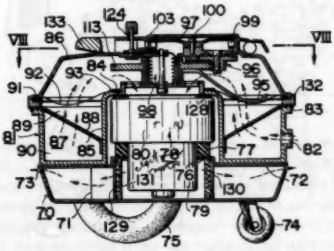
Mitsuo Ohira; Kouiti Sagawa; Ikuo Hata, and Goro Sasai, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 15, 1971, Ser. No. 106,816

Claims priority, application Japan, Jan. 19, 1970, 45/4444; May 13, 1970, 45/40106

Int. Cl. B01d *46/00*

U.S. Cl. 55—299 **4 Claims**



An electric vacuum cleaner wherein a first air passageway for a dust-containing air flow and a second air passageway for an air flow to rotate an air turbine which drives a dust removing device, are formed upstream of an electrically operated fan within the body of the vacuum cleaner, and the first and second air passageways are selectively switched from one another, whereby the normal cleaning operation and an operation to remove the dust deposited on a dust filter disposed in the first air passageway are selectively obtained.

3,731,466

CONTINUOUS FLOW MULTIPLE TRAP FOR LOW TEMPERATURE REDUCED PRESSURE GAS CHROMATOGRAPHY

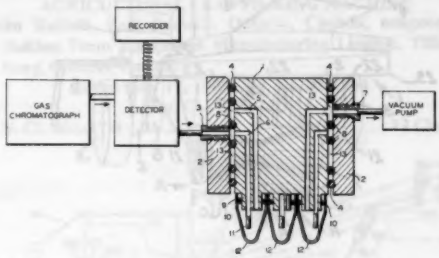
Chester E. Kunsman, and Richard L. Coleman, both of Winter Haven, Fla., assignors to The United States of America as represented by the Secretary of Agriculture

Filed July 14, 1971, Ser. No. 162,461

Int. Cl. B01d *15/08*

U.S. Cl. 55—386 **1 Claim**

A continuous flow multiple trapping system has been designed for reduced pressure, low temperature gas chromatographic analysis. This device allows many samples to be collected without breaking the flow of carrier gas through the detector. It was specifically designed to operate under reduced pressure. Reduced pressure GLC will allow the sample mixtures to be resolved at lower temperatures, thus avoiding thermal rearrangement caused by relatively high temperature GLC separations.



3,731,467

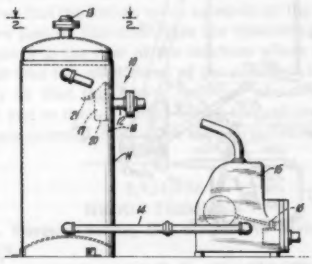
GAS AND LIQUID SEPARATOR

Irving C. Jennings, c/o The Nash Engineering Co., South Norwalk, Conn.

Continuation of Ser. No. 1,725, Jan. 9, 1970, abandoned. This application March 20, 1972, Ser. No. 236,516

Int. Cl. B01d *45/12*

U.S. Cl. 55—459 **2 Claims**



A separator is provided for separating the liquid and gaseous components of a fluid stream. The separator is comprised of a cylindrical tank, a fluid stream inlet pipe for radially introducing the fluid stream into the cylindrical tank and a baffle mounted within the cylindrical tank for changing the flow path of the radially introduced fluid stream to substantially tangentially strike the interior wall surface of the cylindrical tank whereby the fluid stream flows around the interior wall surface. The liquid and gaseous components of the fluid stream therefore become separated and are removed from the cylindrical tank through separate gas and liquid outlet channels respectively.

3,731,468

SWATH TREATING APPARATUS

Harold Blumhardt, Fredonia, N. Dak.

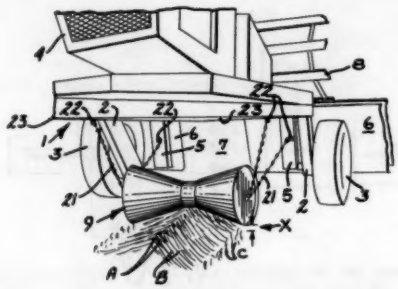
Filed Sept. 1, 1971, Ser. No. 176,847

Int. Cl. A01d *43/00*

U.S. Cl. 56—1 **2 Claims**

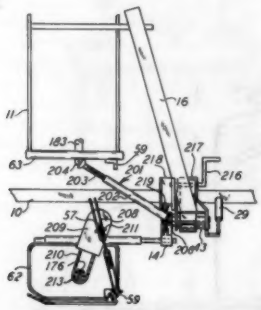
A crop swath roller including a pair of axially aligned frustoconical sections having adjacent axially inner ends of relative-

ly small diameter and axially outer ends of relatively large diameter. The roller is supported from a mobile frame for



rolling movement longitudinally over a swath or windrow of cut crop.

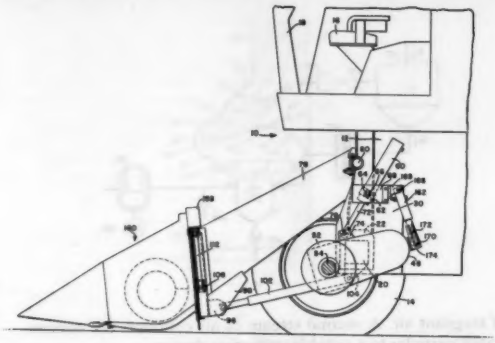
3,731,469
CONVERTIBLE GANG LAWN MOWER
Sahag C. Akgulian; Donald G. Haffner, both of Racine, Wis., and Sherman C. Heth, Sturtevant, Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.
Filed Jan. 24, 1972, Ser. No. 220,193
Int. Cl. A01d *75/30*
U.S. Cl. 56—7 **7 Claims**



A convertible gang lawn mower having a supporting vehicle and a plurality of lawn mowers pivotally mounted on the vehicle to be raised and lowered thereon. A drive connection exists between a driving mower and a driven mower, and a limit connector is also attached between the mowers for limiting the relative motion therebetween. Storage supports are included in the machine for storing the drive connector and the limit connector when they are disconnected between the mowers so that only the driving mower is left in mowing position and the driven power is placed in the stored or transport position on the machine. Hydraulic lift cylinders are on the machine for lifting the mowers, and an additional crank-type lift is also on the machine for lifting one of the lowers when the hydraulic cylinders are not in use.

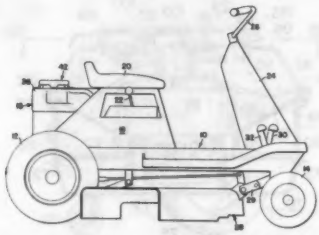
3,731,470
SELF-LEVELING COMBINE
George Kent Cornish, and Melvin Louis Knollman, both of East Moline, Ill., assignors to Deere & Company, Moline, Ill.
Filed Feb. 14, 1972, Ser. No. 225,874
Int. Cl. A01d *67/00*
U.S. Cl. 56—10.4 **19 Claims**

The crop-gathering unit of a self-leveling combine is connected to the combine feeder house for movement about either one of a pair of pivots positioned at opposite sides of the feeder house so that as the crop-gathering unit pivots with respect to the feeder house, the bottom edge of the crop



discharge opening in the crop-gathering unit is never below the bottom edge of the crop-receiving opening in the feeder house.

3,731,471
SAFE STARTING SYSTEM FOR LAWN AND GARDEN EQUIPMENT
Curtis Reinhard Bening, Burnett, Wis., assignor to Deere & Company, Moline, Ill.
Filed March 22, 1972, Ser. No. 236,909
Int. Cl. A01d *75/18*
U.S. Cl. 56—10.5 **10 Claims**

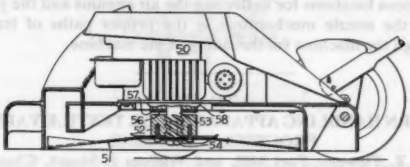


A riding mower has an internal combustion engine with a magneto type ignition system and a recoil starter. A mower is suspended from the tractor and driven from the engine through a belt drive, which includes a clutch, while the traction wheels are driven through a different drive system, which also includes a clutch. A pair of parallel connected switches are respectively connected to the clutches so that they close when the clutches are engaged, and the switches are connected to the magneto primary coil and a normally closed centrifugal switch, which is disposed between the engine flywheel and the recoil starting mechanism and opens only when the engine reaches a predetermined speed. When the centrifugal switch is closed and either of the clutch switches are closed, the magneto primary is shorted to ground, preventing the starting of the engine when either of the clutches is engaged. When the engine reaches the predetermined speed, the centrifugal switch opens, so that either clutch can be engaged without shorting out the magneto primary coil.

3,731,472
ROTARY MOWER SPINDLE BRAKE
Igor Kamlukin, Mequon, Wis., assignor to Simplicity Manufacturing Company, Inc., Port Washington, Wis.
Filed March 27, 1972, Ser. No. 238,387
Int. Cl. A01d *35/26*
U.S. Cl. 56—11.3 **6 Claims**

A braking mechanism for use with rotary lawnmowers utilizing a vertically extending spindle having a lower end

upon which is attached a mower blade and having an upper end mounting a driven sheave. Such sheave being provided with a surface spaced from a stationary surface and being provided with a friction lining separating the two surfaces. Such



sheave being threadably engaged with a collar splined to said spindle so that upon termination of power to said spindle, said sheave rotates relative to said collar bringing such surfaces into frictional engagement with said friction lining for decelerating said spindle.

3,731,473

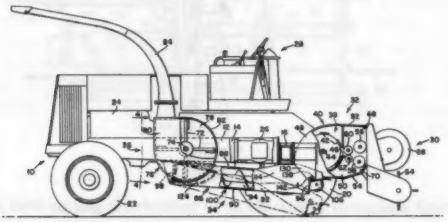
HARVESTING MACHINE

John Joseph Hennen, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Nov. 4, 1971, Ser. No. 195,630

Int. Cl. A01d *45/02*

U.S. Cl. 56—14.4 **4 Claims**



A self-propelled forage harvester having a forwardly mounted cutterhead unit for reducing crop material, a blower unit spaced rearwardly from the cutterhead unit for blowing the reduced crop material into an adjacent receptacle, and a longitudinally extending conveyor unit for conveying the reduced crop material from the cutterhead unit to the blower unit. The conveyor unit extends beneath various operating components on the harvester and is quickly removable to gain service access to these components.

3,731,474

CHARGING CIRCUIT FOR WRIST WATCH HAVING SOLAR BATTERY

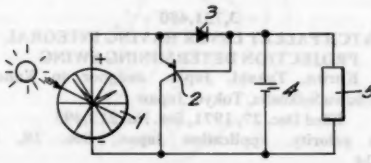
Yuki Tsuruishi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 212,297

Claims priority, application Japan, Dec. 29, 1970, 45/128116; Feb. 18, 1971, 46/7157

Int. Cl. G04c *3/00*; H01j *39/12*

U.S. Cl. 58—23 C **8 Claims**



In a wristwatch having therein a solar battery and a secondary battery charged by said solar battery, a charging circuit prevents too high a current from flowing when the solar battery is strongly illuminated. Provision is also made for preventing overcharge of the secondary battery.

3,731,475

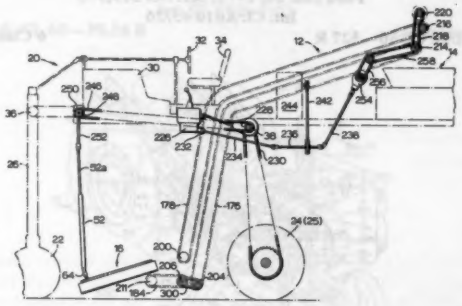
AGRICULTURAL LEAF PICKING MACHINE

John Balthes, Port Burwell, Ontario, Canada, assignor to Balthes Farm Equipment Manufacturing Limited, Tillsonburg, Ontario, Canada

Filed Nov. 17, 1969, Ser. No. 877,361

Int. Cl. A01d *45/16*

U.S. Cl. 56—27.5 **12 Claims**



Tobacco priming machine which is especially adapted for mounting on a self propelled tobacco harvester. The tobacco priming heads operate in pairs so that the tobacco plant enters between a pair of heads; and the heads are tilted with rearward moving spaced knives between the heads so that the relative speed of any one rearward moving knife and the tobacco stalk is zero but so that the knives move upwards on the stalk as the heads move past it. The conveyors are mounted to carry the tobacco leaves to the rear of the machine where an air-blast delays their free fall off the end of the conveyor into a chute sufficiently so that the heavy, butt-end of each leaf turns downward and so that all leaves falling through the chute and into a bin are oriented in the same stem-first direction.

3,731,476

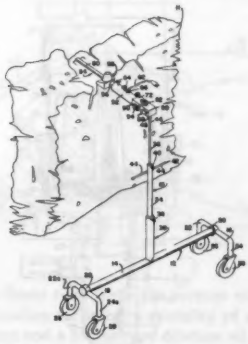
HEDGE TRIMMER

Oakley B. Burgess, Salem, Ill., assignor to Alvin L. Shook, Salem, Ill.

Filed Feb. 14, 1972, Ser. No. 225,929

Int. Cl. A01d *55/00*

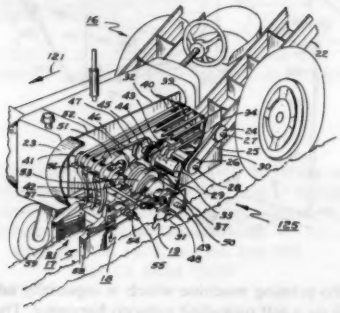
U.S. Cl. 56—237 **6 Claims**



A hedge trimmer has a wheel mounted carriage adapted to be moved parallel to a hedge and supporting an upstanding telescopic shafting which hingedly carries at its upper end a

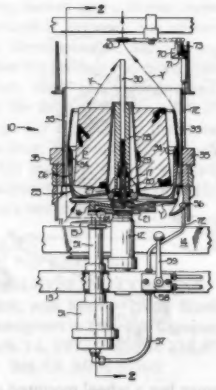
tubular support within which the handle of an electric clipper is lodged. The clipper, through the hinge connection and the shafting, is adjustable in curvilinear paths about horizontal and vertical axes relative to the upstanding shafting and the carriage and is positionable, through the telescopic shafting, at various heights. It is also rotatably adjustable within the tubular support so as to position its cutter bars at various angular positions relative to the support.

3,731,477
HARVESTER FOR HEADED VEGETABLES
James G. Coon, 68 Madrid Plaza, Mesa, Ariz.
Filed Jan. 24, 1972, Ser. No. 219,975
Int. Cl. A01d *45/26*
U.S. Cl. 56—327 R **6 Claims**



A high speed lettuce harvesting machine comprising a vehicle adapted to move along vegetable rows to be harvested, a pair of vegetable head-engaging sensing arms mounted on said vehicle, a plurality of sensor belts mounted on said arms, the sensor belts being adapted to be deflected by the circumference of said vegetable head to guide and actuate a cutting blade toward the stem of the vegetable head so as to sever only fully grown heads and to transport them to a conveyor.

3,731,478
AIR OPERATED YARN THREADING MECHANISMS IN A TEXTILE YARN PROCESSING MACHINE
Gustav Franzen, Neersen, Germany, assignor to Palitex Project Company, Krefeld, Germany
Filed July 7, 1971, Ser. No. 160,358
Claims priority, application Germany, July 15, 1970, P 20 25 025.8
Int. Cl. D01h *7/86*, *1/10*
U.S. Cl. 57—58.7 **11 Claims**



The combination in textile yarn processing machines, such as twisters or the like, of automatic yarn threading mechanisms including air operated aspirating nozzles forming a part of the rotor mechanism of the machine and positioned in other locations for pulling the yarn in and pushing the yarn out of the nozzle mechanisms and deflection means positioned at various locations for deflecting the air streams and the yarn from the nozzle mechanisms in the proper paths of travel through the machine for threading of the machine.

3,731,479
YARN HANDLING APPARATUS FOR TEXTILE YARN PROCESSING MACHINE
Thad T. Flowers, Fort Mill, and William I. Stuart, Chester, S.C., assignors to Springs Mills, Inc., Fort Mill, S.C.
Continuation-in-part of Ser. No. 34,428, May 4, 1970, abandoned. This application Oct. 27, 1971, Ser. No. 193,043
Int. Cl. D01h *7/08*
U.S. Cl. 57—131 **11 Claims**

The improvements, in a yarn processing machine including elongate rotating spindles for receiving hollow yarn carrying bobbins and a magnetic seater device for magnetically seating the bobbins on the spindles in non-friction fitting association, of apparatus for receiving, guiding and holding yarn during bobbin doffing, bobbin replenishment and yarn processing start-up procedures of the yarn processing machine comprising a horizontal protruding lip extending outwardly from the magnetic bobbin seater devices around the spindles and defining a plurality of separate segments slightly spaced from each other for forming generally V-shaped grooves between each of the segments. The improved apparatus may also include means for holding the last few wraps of the yarn prior to doffing of the full bobbins from the spindles and means for cutting off the loose tails of yarn extending from the bottom of the spindles as a result of bobbin doffing operations.

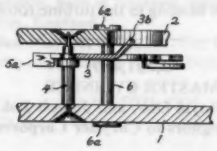
ERRATUM

For Class 58—23 see:
Patent No. 3,731,474

3,731,480
WATCH PALLET LEVER HAVING INTEGRAL PROJECTION DETERMINING SWING
Hirohisa Kurita, Takaki, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Filed Dec. 27, 1971, Ser. No. 212,495
Claims priority, application Japan, Dec. 28, 1970, 45/132724
Int. Cl. G04b *15/00*
U.S. Cl. 58—116 R **7 Claims**

A watch pallet lever formed of sheet material has an integral

tab bent up to form a projection engageable with opposite



edges of a notch or opening in a bridge plate to define the operational region of the pallet lever.

3,731,481

TIME-SETTING DEVICE FOR ELECTRIC TIMEPIECE

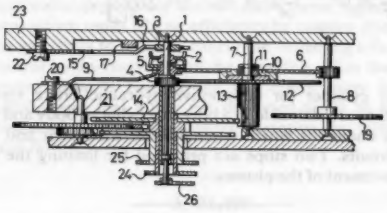
Yasuaki Nakayama, Higashikurume-shi, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed March 24, 1972, Ser. No. 237,680

Claims priority, application Japan, March 27, 1971, 46/21819

Int. Cl. G04c *9/00*

U.S. Cl. 58—34 **4 Claims**



A time-setting mechanism in an electronic timepiece fitted with a seconds hand-locking device and a seconds-hand arbor, characterized in that the seconds-hand arbor is provided with a clutch and a locking cam, said clutch being adapted for on-off control of a seconds hand pinion relative to the arbor.

3,731,482

DEVICE FOR FASTENING A DIAL TO A WATCH MOVEMENT

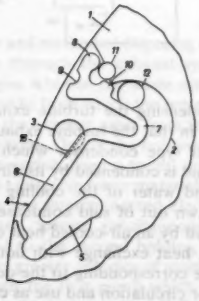
Werner Glanzmann, Bettlach, and Roland Zaugg, Grechen, both of Switzerland, assignors to A. Schild S.A., Grenchen (Canton of Soleure), Switzerland

Filed Nov. 8, 1971, Ser. No. 196,372

Claims priority, application Switzerland, Nov. 26, 1970, 17505/70

Int. Cl. G04b *19/06*

U.S. Cl. 58—127 B **8 Claims**



A mechanism for connecting the dial to the plate of a watch movement in which the plate has holes in it and feet from the dial protrude into these holes. In the plane of the plate there is a spring normally biased to intersect the plate holes through which the dial feet protrude. It is possible to hold the spring away from its normal position to permit installation of the dial feet and then to release it to lock the dial in position.

3,731,483

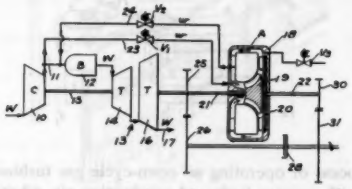
FREE POWER GAS TURBINE ENGINE WITH AERODYNAMIC TORQUE CONVERTER DRIVE

Charles C. Hill, La Jolla, Calif., assignor to Power Technology Corporation, Bloomfield Hills, Mich.

Filed Dec. 29, 1971, Ser. No. 213,437

Int. Cl. F02c *7/02*

U.S. Cl. 60—39.16 R **4 Claims**



A gas turbine engine including a first turbine stage and a second turbine stage, the first turbine stage being connected directly to the compressor and the second turbine stage being unconnected thereto, combined with an aerodynamic torque converter. The aerodynamic torque converter has an input shaft connected to the second stage of the turbine and an output shaft which can be selectively connected to the second stage of the turbine to provide for drive thru the aerodynamic torque converter or through the turbine and bypassing the aerodynamic torque converter.

3,731,484

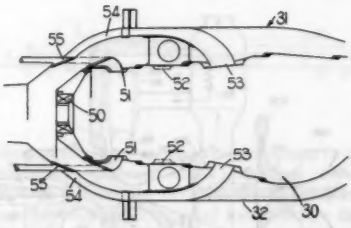
APPARATUS FOR REGULATION OF AIRFLOW TO FLAME TUBES FOR GAS TURBINE ENGINES

Squire Ronald Jackson; Kenneth Greenwood, both of Burnley; Alban Heaton, Blackburn, and Alwin Harrison, Burnley, all of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Division of Ser. No. 783,009, Dec. 11, 1968, Pat. No. 3,577,878. This application Oct. 29, 1970, Ser. No. 85,178

Int. Cl. F02c *3/06*

U.S. Cl. 60—39.23 **1 Claim**



An annular flame tube for a gas turbine engine includes a primary combustion air inlet, a plurality of secondary combustion air inlets and a plurality of dilution air inlets, and variable flow restricting means associated with at least some of the said inlets so as to vary the ratio of secondary combustion air to dilution air, the inlets being formed as nozzles to provide deep penetration of secondary combustion air and dilution air into the flame.

3,731,485
OPEN-CYCLE GAS TURBINE PLANT

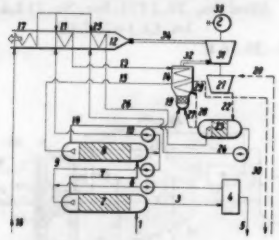
Paul Rudolph, Bad Homburg, and Ernst Kapp, Frankfurt am Main, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 1, 1971, Ser. No. 111,349

Claims priority, application Germany, Feb. 7, 1970, P 20 05 656.1

Int. Cl. F02g 3/00

U.S. Cl. 60—39.05 **9 Claims**



In a process of operating an open-cycle gas turbine plant supplied with gaseous fuels and combustion air, wherein the gas turbine is immediately supplied with the gases departing from the combustion chamber and the gaseous fuels and/or the combustion air are enriched with water vapor lowering the temperature of the gases departing from the combustion chamber, the improvement of sprinkling the flowing gaseous fuel and/or the combustion air immediately before entering the combustion chamber with circulating water which has been heated with waste heat thus saturating the fuel and/or combustion air with steam. The pressure of the circulating water is equal to the pressure of the fuel or of the combustion air and the temperature of the circulating water is lower than the boiling temperature under the pressure of the circulating water.

3,731,486
GAS TURBINES

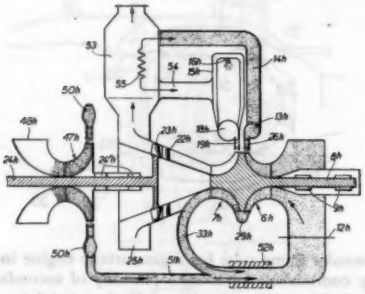
Jean Armand Poulain, Montfermeil, and Jacques Pierre Chaboseau, Limeil-Brevannes, both of France, assignors to Societe Rateau, Paris, France

Continuation-in-part of Ser. No. 73,895, Sept. 21, 1970, abandoned. This application May 24, 1971, Ser. No. 146,145

Claims priority, application France, April 20, 1971, 7113925

Int. Cl. F02c 7/02

U.S. Cl. 60—39.51 R **21 Claims**



A gas turbine unit comprising a turbine fed with hot gas through a furnace to which air is fed by a compressor. The turbine rotor blading is discontinuously cooled by alternating passage into a hot flow and a cold flow. To this end, the turbine comprises separate feed sector areas respectively receiving the hot gas flow emerging from the furnace and a colder flow. The colder flow is a flow of air which is fed directly from the compressor rotor blading to the turbine rotor blading.

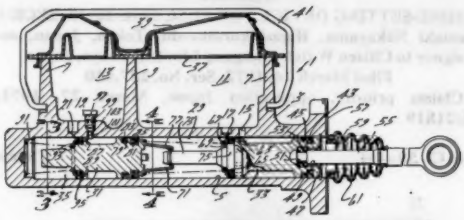
3,731,487
MASTER CYLINDER

Norman H. Beyer, Royal Oak, and Joseph Zuk, Hamtramck, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation-in-part of Ser. No. 33,994, May 4, 1970, abandoned. This application Aug. 23, 1971, Ser. No. 174,251

Int. Cl. F15b 7/00

U.S. Cl. 60—54.6 E **1 Claim**



Master cylinder for automotive hydraulic brake system. Two pistons are slideable in a bore in a cylinder body and provide two chambers which communicate with front and rear brake circuits. Two stops are provided for limiting the outward movement of the pistons.

3,731,488
METHOD OF CONDENSING TURBINE EXHAUST AT THE POWER PLANT

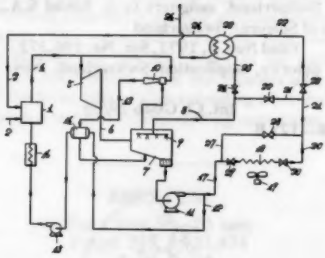
Tetsugoro Sasakura, Nishinomiya, and Seishi Moriya, Kobe, both of Japan, assignors to Sasakura Engineering Co., Ltd., Osaka, Japan

Filed June 25, 1971, Ser. No. 156,718

Claims priority, application Japan, June 30, 1970, 45/57535

Int. Cl. F01k 9/00

U.S. Cl. 60—95 **1 Claim**



A method of condensing the turbine exhaust at a power plant, characterized in that the turbine exhaust is introduced into a direct-contact type condenser which works under a vacuum condition and is condensed by its direct contact with cooling water. Mixed water of the cooling water and condensed water is drawn out of said condenser, a part of the mixed water is cooled by an air-cooled heat exchanger and is further cooled by a heat exchange with liquefied gas down below a temperature corresponding to the degree of vacuum of said condenser for circulation and use as cooling water for said condenser. The remainder is returned to the feed water system of the boiler and the gas vaporized by the afore-mentioned heat exchange is used as boiler fuel.

3,731,489

THRUST DEFLECTOR FOR A GAS TURBINE ENGINE

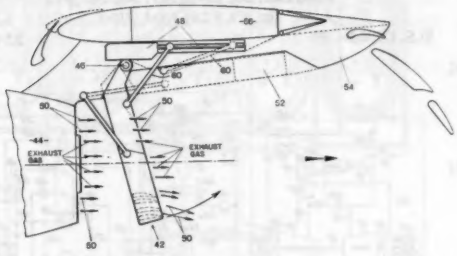
William Thomas Monaghan, Sandiacre, and Leonard John Rodgers, Spondon, both of England, assignors to Rolls-Royce Limited, Derby, England

Filed May 20, 1971, Ser. No. 145,395

Claims priority, application Great Britain, May 22, 1970, 24,833/70

Int. Cl. F02k 3/06

U.S. Cl. 60—226 A 4 Claims



Vectorable engines for aircraft have thrust deflecting apparatus which tends to lose efficiency by causing one portion of the gas efflux to partially cancel the deflecting effect of the apparatus on the remainder of the gas efflux. Thus the present invention deflects half of the gas efflux away from the remainder and that efflux not deflected tends to assist the provision of thrust in the desired direction, by virtue of its natural flowpath.

3,731,490

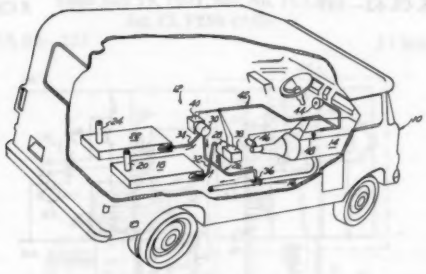
DUAL WASTE DISPOSAL SYSTEM AND METHOD

Charles L. Sargent, Ypsilanti, and John A. Hoffman, Brighton, both of Mich., assignors to Thermasan Corporation, Ann Arbor, Mich.

Filed Jan. 13, 1972, Ser. No. 217,585

Int. Cl. F01n 3/02; B07b 3/00

U.S. Cl. 60—317 12 Claims



Apparatus for and method of disposing of liquid and organic waste materials through the exhaust system of an internal combustion engine wherein the waste materials are collected in two holding tanks from which the materials are metered by two pumps into the exhaust gases from the engine only under controlled conditions. One of the holding tanks is arranged to receive waste materials from a toilet, and the other holding tank is arranged to receive waste materials from sinks, and the like. The pumps are interconnected electrically or mechanically so that they operate simultaneously, and the second pump connected to the second holding tank is arranged to feed substantially greater volumes of waste materials to the exhaust system than the first pump which is connected to the holding tank for the waste materials from the toilet. Pump control means operate the two pumps only in accordance with prescribed conditions relating to the engine and its exhaust system.

3,731,491

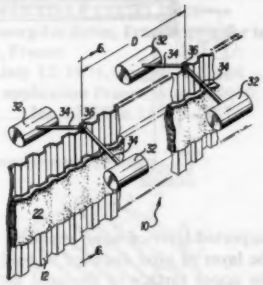
OIL CONTAINMENT BOOM

Arthur L. Markel, and J. Robert R. Harter, both of Miami, Fla., assignors to Reynolds Submarine Services Corporation, Miami, Fla.

Filed Oct. 12, 1971, Ser. No. 188,324

Int. Cl. E02b 15/04

U.S. Cl. 61—1 F 1 Claim



An oil containment boom comprising an elongated strip of corrugated metal which is formed from a plurality of sections secured together end-to-end. The corrugated metal is disposed substantially vertically in a body of water and floated therein with suitable flotation means. In one form of the invention, the flotation means comprises a strip of plastic material adhesively secured to the corrugated metal. In another form of the invention, the previously described flotation means is supplemented with the aid of outrigger or stabilizer floats which extend generally laterally outwardly from the corrugated metal strip. Weights may be attached to the corrugated metal strip to vary the freeboard height of the floating boom.

3,731,492

METHOD OF FORMING STRUCTURES BY DEPOSITION

Georgy Sergeevich Ageev; Ivan Pavlovich Kuptsov, and Lev Veniaminovich Jusim, all of Moscow, U.S.S.R., assignors to Vsesojuzny Gosudarstvenny Ordena Lenina Proektny Institute Teploelektroproekt, Moscow, U.S.S.R.

Filed April 1, 1971, Ser. No. 130,324

Int. Cl. E02b 7/04, 11/00

U.S. Cl. 61—30 2 Claims

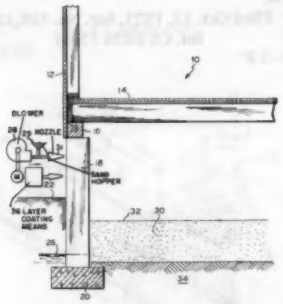
A method of forming structures by deposition from a pulp, comprising placing drainage means at the base portion of the structure to be formed, the drainage means being associated with means for adjusting the rate of water outflow therefrom, depositing pulp directly on the ground above the drainage means so that water in the pulp outflows through the drainage means while solids in the pulp accumulate above the drainage means and form a deposited structure with upper inclined surfaces. The intensity of the outflow of water from the drainage means is controlled in the course of the depositing operation so as to progressively diminish outflow in the direction from the periphery of the structure being deposited toward the central portion thereof.

3,731,493

WATER REPELLENT SAND

Clarence L. Stevens, Hampton, Va., assignor to W. Gary Archer, Richmond, Va.

Filed April 26, 1971, Ser. No. 137,343
Int. Cl. E02d 3/00
U.S. Cl. 61—35 2 Claims



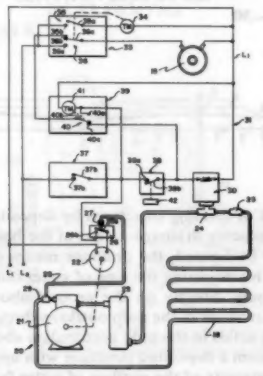
Earth-supported layer of water repellent sand for moisture control, the layer of sand disposed in bulk over a section of ground, the upper surface of the sand extending above the residual ground water level and being essentially level and smooth throughout, and the sand having each particle thereof essentially coated with a layer of silicone resin for eliminating the characteristic of capillary action. Where the sand is placed by blowers or the like in crawl spaces or under houses and other edifices, the moisture level under such edifices is maintained substantially in a dry condition. The sand may be blown into place and the silicone resin may be applied by spraying or blowing simultaneously with the blowing of the sand into the space, or the sand may be separately treated with silicone resin and dried, as above, and then blown under houses or edifices. The moisture control provided by the water repellent sand in part provides an insulating structure layer for eliminating heat loss into cool and damp ground.

3,731,494

CONTROL APPARATUS FOR MILK COOLER

George J. Fleck, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed July 8, 1971, Ser. No. 160,682
Int. Cl. F25d 29/00
U.S. Cl. 62—157 9 Claims



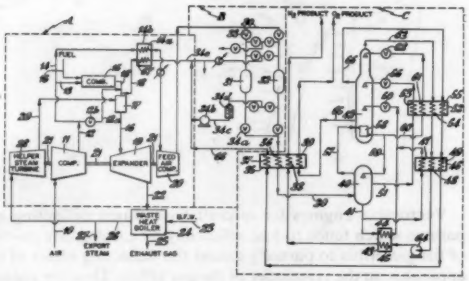
An improved control apparatus for use with a milk cooler such as a farm bulk milk cooler including means for agitating milk in the tank of the cooler. The development permits manual control of the agitating function such as during milk pickup, milk addition, and cooler washing. The control is coordinated with other control elements providing different cooler functions.

3,731,495

PROCESS OF AND APPARATUS FOR AIR SEPARATION WITH NITROGEN QUENCHED POWER TURBINE

Joseph Francis Coveney, North Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,992
Int. Cl. F25j 3/04, 3/00
U.S. Cl. 62—39 22 Claims



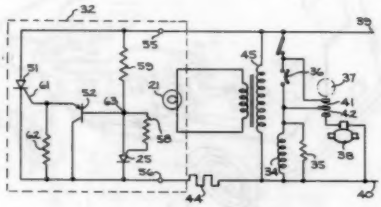
Air is separated by low temperature rectification using a 150–400 psia. column and a 45–140 psia. column, with nitrogen-rich gas from the latter quenching hot combustion gas prior to work expansion of the resulting intermediate temperature gas mixture.

3,731,496

PHOTOELECTRIC ICE LEVEL SENSOR

Lauren L. Frazier, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 31, 1972, Ser. No. 222,177
Int. Cl. F25c 7/00
U.S. Cl. 62—137 5 Claims



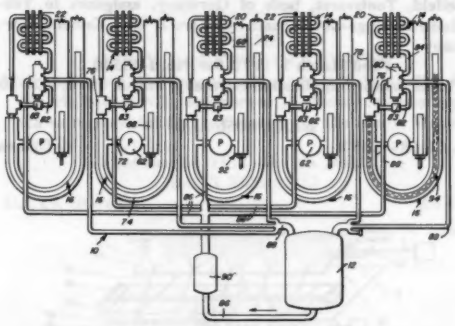
A control circuit for a current activated thermostatic appliance control switch is presented. Current from an AC voltage source is provided through a main SCR, the gate terminal of which is connected through the emitter-base junction of an intermediate transistor to the common terminal of a low voltage rated trigger SCR and voltage dropping resistor connected in series across the AC supply. During the positive half cycle of the AC supply when the normally conducting trigger SCR is switched off in response to a predetermined external condition, current flows to the main SCR gate through the transistor emitter-base junction operating in the zener region to maintain low voltage across the trigger SCR. During negative half cycles of the AC supply the diode action of the transistor's collector base junction connected across the trigger SCR similarly maintains low voltage thereacross. The trigger SCR is shown as a light activated SCR.

3,731,497

MODULAR HEAT PUMP

James O. Ewing, P. O. Box 6037, Nashville, Tenn.

Filed June 30, 1971, Ser. No. 158,219
Int. Cl. F25b *13/00*
U.S. Cl. 62—160 12 Claims



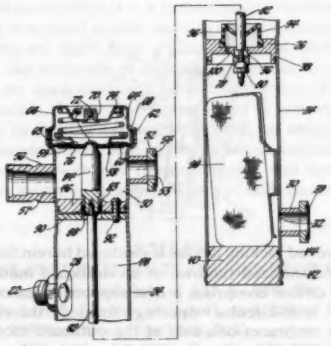
A heat pump assembly including multiple modular heat exchange units associated with a single refrigerant compressor motor unit with each heat exchange module including two heat exchange units which are alternatively and selectively employed as an evaporative heat exchange unit or a condenser heat exchange unit. One heat exchange unit in each module being associated with an ambient air circulating fan for use of the air as a heat exchange medium and the other heat exchange unit in each module associated with a liquid circulating pump system so that the liquid is used as a heat exchange medium.

3,731,498

AUTOMATIC EXPANSION VALVE, PAD MOUNTED, NON-PILOTED

Paul K. Beatenbough, Medina; Gary E. Nichols, Gasport, and Carl A. Scherer, Clarence Center, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed July 19, 1971, Ser. No. 163,593
Int. Cl. F25b *41/04*
U.S. Cl. 62—225 3 Claims



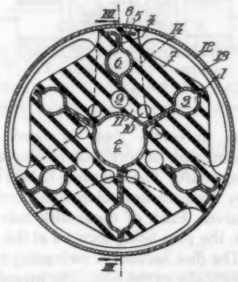
A pressure responsive expansion valve including a tubular member connected to the inlet and outlet of an evaporator. A wall member supported within the tubular member which separates its interior into a control chamber portion adjacent the evaporator outlet and a metering chamber portion adjacent the evaporator inlet. A diaphragm in the control portion having one side exposed to the evaporator outlet pressure and another side exposed to atmosphere and operably connected to a valve member within the metering position by a valve rod which extends through a diaphragm like seal supported by the wall member. The diaphragm is moved in response to increasing refrigerant pressure and causes the valve rod and valve member to move toward a closed position restricting refrigerant flow into the inlet of the evaporator. Likewise, the diaphragm moves in response to decreasing pressure to cause the valve member to move toward an open position thus increasing the flow of refrigerant to the evaporator inlet to maintain the evaporator pressure at a substantially constant level.

3,731,499

FLEXIBLE COUPLINGS

Jean Morlon, 92 Bourg-La-Reine, France, assignor to Paulstra, Levallois-Perret, France

Filed July 12, 1971, Ser. No. 161,538
Claims priority, application France, Aug. 5, 1970, 7028949
Int. Cl. F16d *3/00*
U.S. Cl. 64—11 R 19 Claims



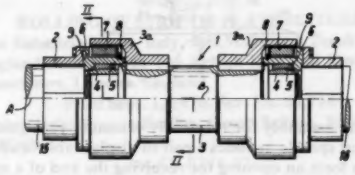
The couplings are for interposing between two shafts and comprise essentially an elastically deformable block positioned between bushes rigidly fixed to the shafts. The elastic unit includes rubber cushions adhered to a plurality of radial reinforcing elements some of which are fixed together in the form of a star while the others are radially movable or floating. This unit is mounted with precompression inside a drum rigidly fixed to stiffening arms. The coupling is especially useful for vehicle engines.

3,731,500

UNIVERSAL JOINT COUPLING

Karl-Dieter Schlums, 3301 Volkmarode, Germany, assignor to Braunschweigische Maschinenbauanstalt, Am alten Bahnhof, Germany

Filed June 1, 1971, Ser. No. 148,649
Claims priority, application Germany, June 4, 1970, P 20 27 349.8
Int. Cl. F16d *3/64*
U.S. Cl. 64—14 11 Claims



The present universal joint coupling permits a tilting movement of two shafts relative to each other and relative to an intermediate connecting piece or vice versa through first and second coupling means preferably arranged mirror symmetrically relative to each other, wherein each coupling means includes cooperating gear teeth with flanks which are suffi-

ciently spaced from each other in the torque transmitting direction for locating a so called vibration mount between adjacent flanks of each torque transmitting flank pair whereby all vibration mounts are rigidly connected to their respective flanks for preventing a relative longitudinal displacement between the flanks and the vibration mounts.

3,731,501

SYNCHRONOUS UNIVERSAL JOINT

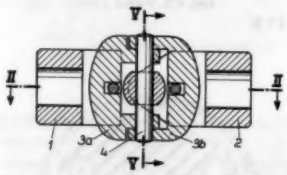
Hajo Pickel, Friedrichstrasse 15, Hachenburg, Germany

Filed March 4, 1971, Ser. No. 120,973

Claims priority, application Germany, April 1, 1970, P 20 15 459.0

Int. Cl. F16d *3/26*

U.S. Cl. 64—17 R **3 Claims**



A synchronous universal joint is used for inelastic, homokinetic transmission of torsional moments between angularly intersecting shafts. The coupling halves of these shafts are connected by transmission elements consisting of two hinge-like disk halves. Each of these disk halves is pivotally mounted on a pin, the pins being located at the same distance from the center. The disk halves are swingably connected by a shaft extending vertically to the pins. The invention is particularly characterized in that the disk halves have oblong holes so that they can slide on the pins. A centering device is used to aline the coupling halves in said center and to fix the disk halves in a central position so that the swiveling axis of the shaft always extends through said center which is the point of intersection of the center lines of the coupling halves.

3,731,502

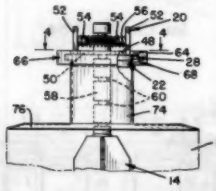
RELEASABLE LOCKING ASSEMBLY

John M. Stearns, Greensboro, N.C., and Albert Dautricourt, Beersel, Belgium, assignors to Macon Machine Company, High Point, N.C.

Filed Feb. 24, 1972, Ser. No. 228,911

Int. Cl. B05c *11/00, 11/122*

U.S. Cl. 68—198 **13 Claims**



A locking assembly for releasably retaining yarn packages on a support spindle includes a pair of displaceable latch parts adapted to form an opening for receiving the end of a spindle when in one position and adapted to lockingly engage a recess in the spindle in another position. The latch plates also lockingly engage a collar having a yarn package engaging flange secured thereto when locked to the spindle. Coil springs located intermediate two handles normally bias the latch parts into engagement with the spindle and the collar. Alternatively, the flange may be spring biased for displacement relative to the latch parts and axially of the package support for applying pressure to the packages.

3,731,503

APPARATUS FOR TEXTILE DYEING

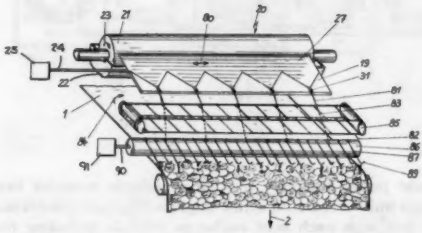
Valentin Appenzeller, Kempen/Niederrhein, and Ferdinand Leifeld, Tonisvorst, both of Germany, assignors to Textilausruestungs-Gesellschaft Schroers & Co., Krefeld, Germany

Filed March 1, 1971, Ser. No. 119,540

Claims priority, application Germany, May 3, 1970, P 20 10 343.9

Int. Cl. B05b *13/04*

U.S. Cl. 68—205 R **9 Claims**



This application is directed to a device and method for applying dye to fabric. The device includes an oscillatory wiper blade which channels dye into streams; the falling streams are divided by a moving wire member supported on a circulating band. A portion of the dye may then be distributed onto the teeth of an adjustable comb-like device from which the dye finally drips upon the fabric to form an irregular pattern. The remainder of the dye falls directly onto the fabric, after being subdivided by the circulating band.

3,731,504

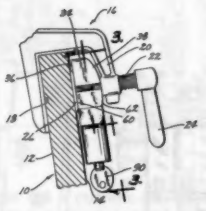
LOCKING DEVICE FOR SECURING AN OUTBOARD MOTOR TO A BOAT

Jack S. Belknap, 714 E. Robinson, Knoxville, Iowa

Filed April 30, 1971, Ser. No. 139,001

Int. Cl. E05b *73/00*; F16b *41/00*

U.S. Cl. 70—58 **6 Claims**



An improved locking device is disclosed herein for preventing the unauthorized removal of an outboard motor from a boat. The device comprises a first support element having a threaded, semi-circular opening formed therein which threadably embraces one side of the outboard motor clamp bolt between the boat transom and the motor clamp arm. A pair of stud elements are secured to and extend from the first support element on opposite sides of the semi-circular opening. A second support element is slidably mounted on the stud elements on the other side of the clamp bolt and has a threaded, semi-circular opening formed therein which threadably engages the other side of the clamp bolt. A pair of nuts are threadably mounted on the stud elements to maintain the two support elements on the blamp bolt. A cap is slidably mounted on the stud elements and has countersunk openings

formed therein which receive the nuts. A key actuated lock is slidably mounted on the stud elements with its lock bolt engaging a notch in at least one of the stud elements to prevent the disassembly of the components of the locking device. The device prevents the clamp bolt from being rotated thereby preventing unauthorized removal of the outboard motor from the bolt transom.

3,731,505

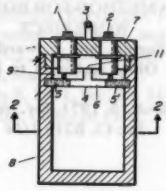
ONE-OUT-OF-TWO LOCK SYSTEM

Max Rosenberg, Parsippany, and Andrew J. Marhefka, Port Morris, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 16, 1971, Ser. No. 208,773

Int. Cl. E05b *65/52*

U.S. Cl. 70—63 **8 Claims**



A One-out-of-two lock system comprising: a container having a first mating means within its interior surface, and also having a release channel within said surface; a cover assembly having peripheral dimensions suitable for effecting a flush fit of said cover assembly over the open end of said container; a first lock located within said cover assembly, said lock having a first engagement member, said engagement member disposed proximate to said first mating means and said engagement member having a retractable second mating means complementary to said first mating means, said second mating means lying within said first mating means only when said first lock is in a locked mode; and a second lock located within said cover assembly having a second engagement member, said second member disposed proximate to said first mating means, and said second member having a retractable third mating means complementary to said first mating means, said third mating means lying within said first mating means only when said second lock is in a locked mode, wherein said cover assembly is secured to said container by said second and third mating means both held within said first mating means whereby the actuation of either of said locks from a locked mode to an open mode will cause a retraction of that lock's mating means, thereby permitting a user to remove said cover assembly by moving said assembly until the unopened lock's mating means, which remains in its initial, unretracted position, is aligned with said release channel, and then by lifting said cover assembly up along the axis of said release channel.

3,731,506

THEFT-PREVENTIVE ATTACHMENT FOR LOCKS

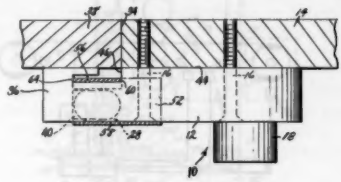
Oscar Greene, deceased, late of 115 E. 86th St., New York, N.Y. (Robert S. Greene, executor), and Robert L. Pelz, executor, 230 Park Ave., New York, N.Y.

Filed May 10, 1971, Ser. No. 141,572

Int. Cl. E05b *65/08*

U.S. Cl. 70—97 **4 Claims**

A theft-preventive attachment for locks of the rim type which are mounted on sliding doors and movable into engagement with a keeper mounted on the door jamb, both lock and keeper having interfitting bolting fingers or projections. The attachment is in the form of a tube which fits snugly around the projections on the lock body and is carried thereby toward the keeper as the door is slid closed. When the door is closed and the lock bolted, the tube encloses the interfitting bolting projections so that they are not exposed or accessible from the



front of the lock and cannot be tampered with. The front wall of the attachment also extends beyond the tube and covers over the mounting bolts of the lock body.

3,731,507

CYLINDER LOCK

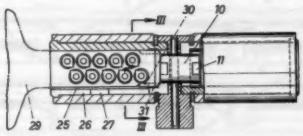
Heinz Wolter, Cologne-Lindenthal, Germany, assignor to Firma Josef Voss KG., Cologne, Germany

Filed April 7, 1972, Ser. No. 242,083

Claims priority, application Germany, April 10, 1971, P 21 17 736.6

Int. Cl. E05b *15/14, 27/06*

U.S. Cl. 70—358 **3 Claims**



A cylinder lock which comprises a key to be inserted into a key slot of a core and arranging tumblers with cavities provided with wide faces of the key. A housing has a flange projecting radially to the core. At least two rows of non-rotatable tumbler pins are arranged in the flange and sit set-off to each other due to a non-round cross-section and uniform bearing bore. One of the wide faces of the key slot is pointing in symmetric cross position towards the flange. The tumbler pins have a cylindrical jacket face, and the latter leads tangentially into two abutting planes at an edge pointing towards the longitudinal center plane of said flange, and one of said planes extending crosswise to the longitudinal direction of said flange and the other of said planes extending in the longitudinal direction of said flange.

3,731,508

ROLLING OF STRIP OR PLATE MATERIAL

Bruno Sabatini, Roma, Italy, and Mahmoud Tarokh, London, England, assignors to The British Iron and Steel Research Association, London, England

Filed Sept. 1, 1970, Ser. No. 68,716

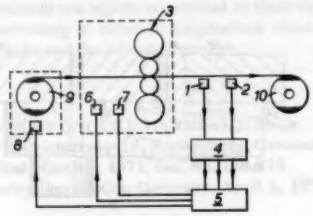
Claims priority, application Great Britain, Sept. 3, 1969, 43,645/69

Int. Cl. B21b *37/02*

U.S. Cl. 72—9 **20 Claims**

Strip or plate material being rolled under symmetrical rolling conditions is simultaneously corrected for gauge and shape errors in a single integrated gauge and shape control system, by detecting its gauge and shape upon leaving the rolling mill; expressing detected shape as a defined combination of different curves and deriving defined error signals from

coefficients of the curves; deriving an error signal from detected gauge; translating said error signals into defined control signals; and feeding each control signal to a respective one of a plurality of different rolling mill control means.



3,731,509

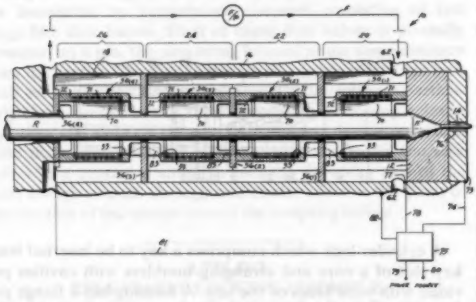
CONTINUOUS MATERIAL FEEDING AND DEFORMATION PROCESS

Francis J. Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 876,940, Nov. 14, 1969, Pat. No. 3,667,267, which is a continuation-in-part of Ser. No. 794,488, Jan. 28, 1969. This application Oct. 4, 1971, Ser. No. 186,368

Int. Cl. B21c *31/00*

U.S. Cl. 72—60 **10 Claims**



Disclosed herein is a process in which flowing fluids are utilized to apply viscous drag forces to a rod of indefinite length and advance it continuously through an extrusion die, to produce a continuous product, for example, a wire. The flowing fluids also control the axial and radial stresses in the rod, sealing it into and out of a treating environment so that undesirable rod pinch-off, bulging, or tension failure is avoided. The temperature, and hence viscosity, of the flowing fluids may be adjusted to control viscous drag forces.

3,731,510

CROSS-ROLLING MACHINE HAVING WORKPIECE BLANK SUPPORT

Hidehiko Tsukamoto, and Nobutaka Maeda, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

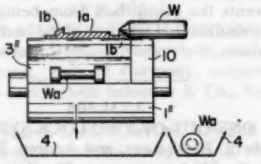
Filed June 21, 1971, Ser. No. 154,837

Claims priority, application Japan, June 25, 1970, 45/54779

Int. Cl. B21h *9/00*

U.S. Cl. 72—71 **5 Claims**

A cross-rolling machine comprises a pair of spaced apart rollers having outwardly extending wedge-shaped blades or dies on the periphery which engage a workpiece positioned between the rollers to form the workpiece. The rollers carry cutters at the ends of the dies which engage the workpiece to separate from the workpiece blank and the workpiece falls into a receiving notch defined in the periphery of the rolls at the ends of the dies. Each roller is provided with an arcuate insert or additional support piece which extends over the complete notch area at the workpiece feeding end and it provides a support for the workpiece blank after the workpiece has been severed therefrom.



3,731,511

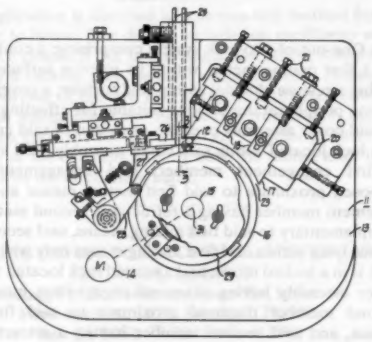
MACHINE AND METHOD FOR ROLLING CONICAL WORKPIECE

Ronald J. Matej, Parma, and Edward A. Prutton, Parma Heights, both of Ohio, assignors to Prutton Corporation, Cleveland, Ohio

Filed March 15, 1971, Ser. No. 124,302

Int. Cl. B21h *1/14*

U.S. Cl. 72—92 **31 Claims**



A machine and method for rolling a conical workpiece is disclosed wherein relatively rotatable die means rotate a workpiece therebetween in planetary motion. A shoulder on one die urges the workpiece in one axial direction and a shoulder on the other die acts on the workpiece in an opposite axial direction to form roll thereon a crowned surface on the large end of the workpiece. The tilting or skewing of the workpiece relative to the dies helps establish this crowned end on the workpiece.

3,731,512

ROLLING MILL CUTTING APPARATUS AND METHOD

Ralph A. Vogel, Three Rivers, Mich., and Kenneth F. Edwards, Lancaster, Ohio, assignors to Essex International, Inc., Fort Wayne, Ind.

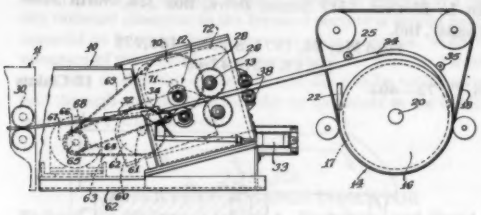
Filed May 7, 1971, Ser. No. 141,153

Int. Cl. B21b *1/00*

U.S. Cl. 72—203 **5 Claims**

A method and apparatus for selectively cutting a continuously moving cast metal bar in a rolling mill. The cast metal bar is fed from a continuous casting wheel through a pair of rollers for a first reduction in its cross-sectional area. Rotating helical cutters are located immediately after the first set of rollers for cutting the cast metal bar at an acute angle relative to the central longitudinal axis of the bar, so as to provide a substantially pointed leading edge for the cast metal bar. Immediately following the rotating cutters, a second set of rollers

are provided for a second reduction in the cross-sectional area



of the cast metal bar. The cutters are selectively activated for severing or cutting the bar when desired.

3,731,513

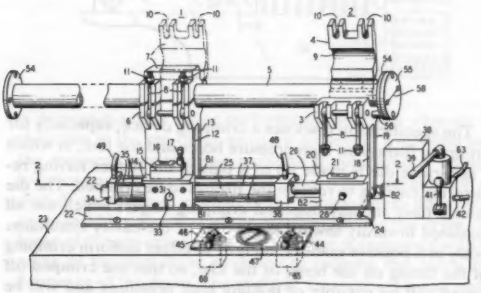
METHOD AND APPARATUS FOR BENDING AN ELONGATED OBJECT

Wilfred Julius Kindermann, Chatham, and Emil David Knab, Whippany, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 8, 1971, Ser. No. 160,782

Int. Cl. B21d *11/02*

U.S. Cl. 72—295 **3 Claims**



Method and apparatus for bending an elongated object. The method comprises gripping at least two portions of the object with rigid instrumentalities, which are spaced apart by a predetermined distance, and then tilting the instrumentalities simultaneously in opposite directions to a calculated extent. The apparatus includes at least two clamping devices for retaining respectively different portions of the object. The clamping devices have base portions which are connected together by means having an extensible portion. Means are provided for lengthening the extensible portions and for thereby forcibly increasing the spacing between the base portions.

3,731,514

CLEAT BENDER

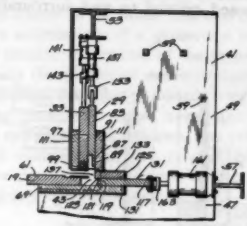
Albert J. Deibele, Jr., 616 Paine Street, Keil, Wis.

Filed Feb. 7, 1971, Ser. No. 104,644

Int. Cl. B21d *41/00*

U.S. Cl. 72—306 **11 Claims**

Disclosed herein is a sheet metal cleat, together with a method and apparatus for forming material such as sheet metal into U-shaped cleats. The sheet metal cleat includes a planar edge margin having an outer or free edge which is spaced at a uniform distance from the unbent portion of the sheet metal. The method involves bending of the sheet metal around the end of a die of uniform thickness. The apparatus includes a single die and a pair of metal forming members which are movable along paths at right angles to each other and relative to the die so as to bend the sheet metal around an end of the die into a U-shape. Also included is a clamping member movable in parallel relation to and in the same guideway as one of the punches. The apparatus is also particularly designed to afford side loading and unloading, as well as front loading.



3,731,515

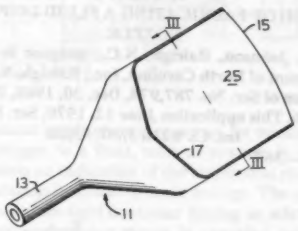
METHOD OF FORMING AN INTEGRAL BLADE AND TRUNNION UNIT FROM A TUBULAR MEMBER

Ralph E. Master, Washington; Richard D. Philipsen, Peoria; Kenneth E. Starr, Manito, and Herbert C. Unkrich, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 813,081, April 3, 1969, abandoned. This application Sept. 8, 1970, Ser. No. 70,328

Int. Cl. B21d *3/00*

U.S. Cl. 72—367 **6 Claims**



For a reversible fan, a blade is manufactured from a tubular member of a proper gage and diameter by spreading or flattening one end into a blade shape and swaging the other end of the tubular member to a reduced diameter to form an integral trunnion. The tubular member may be first slotted to aid in spreading the blade portion into the proper blade configuration. At the distal end of the trunnion of the integral blade and trunnion unit, a portion of the trunnion can be upset to provide a shoulder for retaining and positioning the integral blade and trunnion in a fan hub in one of two positions for reversing air flow. Springs can be employed to bias each integral blade and trunnion radially outwardly so that the position of these units will be maintained by engagement with complementary indexing structure in the associated hub. As an alternative to upsetting the end of the trunnion, a washer member may be secured on its distal end and a blade indexing mechanism provided by the washer member and cooperating hub assembly.

3,731,516

METHOD FOR MAKING BEVEL GEAR

Fritz Dohmann, 851 Furth; Karl Gulden, and Willy Lehner, both of 85 Nurnberg, all of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte A.G., Hannover, Germany

Filed June 29, 1971, Ser. No. 158,011

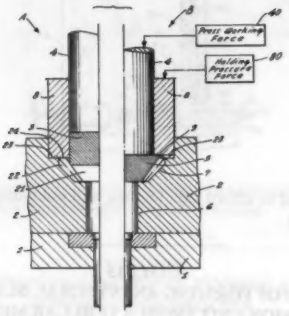
Claims priority, application Germany, July 9, 1970, P 20 34 043.6

Int. Cl. B21j *5/12*

U.S. Cl. 72—354 **3 Claims**

Apparatus for making bevel gear using a die having contour and profile for obtaining a bevel gear upon pressing a blank

into the die cavity, a first press punch has a working surface smaller than the largest outer diameter of the bevel gear to be made for pressing the blank into the die cavity, and a second press punch disposed coaxial to and surrounding the first



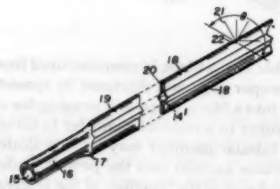
punch and being independently axially movable relative thereto, the second punch having an annular face disposed adjacent that part of the die establishing the teeth of largest diameter of the bevel gear.

3,731,517

METHOD OF FABRICATING A FLUID DISPERSION NOZZLE

William H. Johnson, Raleigh, N.C., assignor to Patent and Development of North Carolina, Inc., Raleigh, N.C.

Division of Ser. No. 787,974, Dec. 30, 1968, Pat. No. 3,584,786. This application June 12, 1970, Ser. No. 57,866
Int. Cl. B21d *3/00, 53/26*
U.S. Cl. 72—367 **4 Claims**



A single element fluid dispersion nozzle for achieving unusually fine atomization of liquids and a wide angle flat-fan dispersion of both liquids and gases uniformly and over a wide range of capacity and pressure. These features, heretofore unavailable commercially in a single element, have been achieved in practice by a unique design that: (1) minimizes the diameter of the orifice aperture down to about 0.001 inch, (2) maximizes the dispersion angle up to at least 180 degrees, (3) assures a uniformly curved corona orifice cavity at its outer extremity, (4) allows extensible lengths with multiple apertures therein and, (5) provides equi-pressure among apertures.

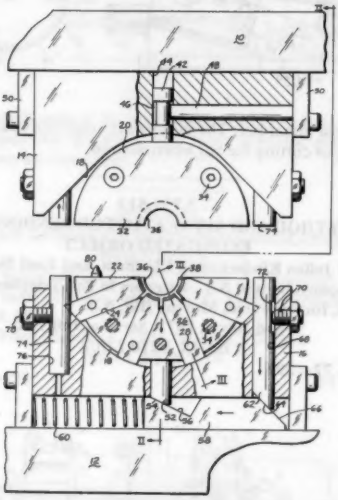
The long tube-like structure has a main feed cavity with at least one fluidly connected corona orifice cavity extending outwardly therefrom. The inner edge of a section thru the corona orifice cavity would be an arc, approximating a circle, having a diameter as minute as 0.001 inch. The simplicity of this structure and the unique and easily varied relationship of the cavities, in combination with the technique of intersection to produce minimum orifice areas and maximum dispersion angles results in outstanding improvements in performance, manufacturing and economy.

3,731,518

CRIMPING DIE ARRANGEMENT

Glen L. Blocher, 1517 Sunset Drive, Box 326, North Manchester, Ind.

Filed May 26, 1971, Ser. No. 146,975
Int. Cl. B21d *41/00*
U.S. Cl. 72—402 **10 Claims**



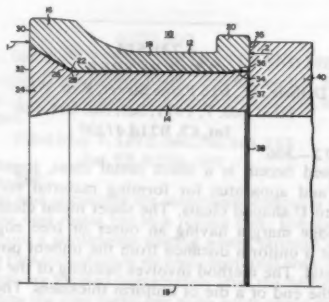
The specification discloses a crimping device, especially for crimping fittings on high pressure hoses and the like, in which a separable die is made up of a pair of die bodies having registering cavities to receive the fittings to be crimped. The die bodies have radially disposed crimping fingers which are all actuated inwardly toward the center of the cavity simultaneously in a positive manner, thereby to effect uniform crimping of the fitting on the hose, or the like, so that the crimped off fitting will be capable of holding high pressures and will be perfectly round in the crimped region thereof.

3,731,519

TWO PIECE FLEXING DIE HOLDER

Maurice W. Mahns, and Clark O. Stockdale, Jr., both of Pittsburgh, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed July 29, 1971, Ser. No. 167,321
Int. Cl. B21c *3/06;* **B21d** *37/04*
U.S. Cl. 72—468 **4 Claims**



A two piece die holder comprising an inner annular member (for holding an extrusion die) concentrically mounted and axi-

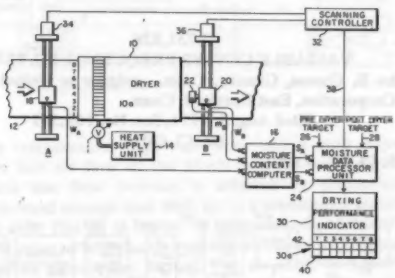
ally movable within an outer annular member. The outer annular member has a thickness dimension and configuration which allows the forward portion thereof to expand in a radially outward direction as the forward portion is forced against material to be extruded under extrusion pressure. With termination of the extrusion pressure, the outer annular member contracts so that the die holder and die can be withdrawn in tact through an extrusion cylinder or container at the completion of the extrusion cycle.

3,731,520

DRYER PERFORMANCE INDICATOR

Richard W. Hickman; Antoni A. Rocheleau, and David A. Spitz, all of Columbus, Ohio, assignors to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Oct. 5, 1967, Ser. No. 673,129
Int. Cl. G01n *5/02*
U.S. Cl. 73—73 **22 Claims**



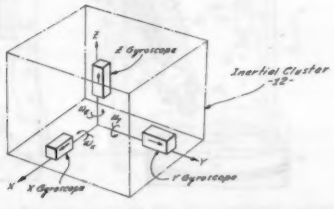
A cross-machine dryer performance indicator wherein the deviation in the pre-dryer moisture content of a material from the average cross-machine moisture is compared at multiple locations across the width of the dryer with a deviation in the post-dryer moixture content of the material from the average cross-machine moisture of the material leaving the dryer. The sense of the pre-dryer moisture deviation is compared with the sense of the post-dryer deviation to indicate the drying performance of the dryer. The width of the material is scanned to measure the average moisture in the material both before and after drying to provide an indication of the performance profile of the dryer. A readout of dryer performance profile indicates whether the dryer's performance is good, poor or indeterminate across its width.

3,731,521

SYSTEM AND METHOD FOR MONITORING THE PERFORMANCE OF A DUAL PLATFORM INERTIAL NAVIGATION SYSTEM

Edwin G. Solov, Wayne, and Frank J. Pasquariello, Paterson, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Sept. 8, 1971, Ser. No. 178,669
Int. Cl. G01c *21/00*
U.S. Cl. 73—1 E **6 Claims**



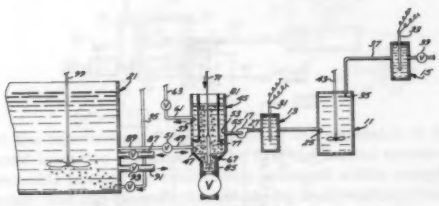
An improved monitoring system and method is provided for comparing the orientations of two inertial platforms in an inertial navigation system so as to determine whether or not any of the gyroscopes in either platform has failed and, if so, to identify the failed gyroscope. The two inertial platforms are positioned so that the inertial cluster of one is skewed relative to the inertial cluster of the other. The two clusters will change their relative orientations if a gyroscope in either begins to drift. In the monitoring system of the invention, the synchro read-outs from the platforms are introduced to a computer which transforms the cluster coordinates into body coordinates. The computer then computes the relationship between the two cluster coordinates, and provides a particular read-out for variations in the relationship. This read-out identifies the particular gyroscope in the particular inertial platform which is malfunctioning.

3,731,522

METHOD AND APPARATUS FOR DETERMINING OXYGEN CONSUMPTION RATE IN SEWAGE

Ritchie D. Mikesell, Anaheim, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 30, 1970, Ser. No. 77,266
Int. Cl. G01n *27/26*
U.S. Cl. 73—19 **9 Claims**



A continuous respirometer apparatus for measuring the rate at which oxygen in a fluid, such as sewage, is consumed to thereby obtain an indication of the respiration rate of the bacterial population included in such sewage. The apparatus includes a closed air-tight container having an inlet and an outlet. Inlet oxygen sensing means is provided for sensing the amount of dissolved oxygen in the fluid entering the container and outlet oxygen sensing means is provided for sensing the amount of oxygen in the sewage exhausted out the outlet. Pump means is provided for circulating the sewage through the closed container at a constant flow rate whereby the amount of dissolved oxygen in the sewage may be determined at both the inlet and outlet to thereby enable the operator to determine the rate at which such oxygen is consumed or respired by the bacteria included in the sewage.

3,731,523

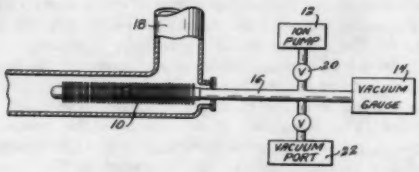
HYDROGEN ACTIVITY METER

Donald R. Vissers, Naperville; John T. Holmes, Downers Grove, and Paul A. Nelson, Wheaton, all of Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 23, 1971, Ser. No. 117,990
Int. Cl. G01n *7/10*
U.S. Cl. 73—19 **8 Claims**

A device for and method of measuring the hydrogen concentration in liquid sodium. A thin-wall, tubular, annealed nickel probe in contact with liquid sodium is connected to an ion pump and a vacuum gauge. A vacuum is created within the nickel probe by the ion pump, which thereafter is isolated from the remainder of the device. Hydrogen atoms in the liquid sodium diffuse through the wall of the probe and into the interior thereof until an equilibrium between hydrogen atoms within the probe and hydrogen atoms in the liquid sodium is obtained. Such diffusion by hydrogen atoms into the probe results in a pressure change within the probe. The pressure change occurring between the time of initial probe

evacuation and the time equilibrium of the hydrogen atoms is obtained is measured by the vacuum gauge, and this pressure



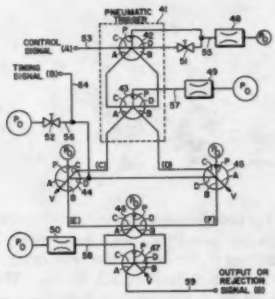
change is indicative of the hydrogen concentration in the liquid sodium.

3,731,524

FLUIDIC CONTROL CIRCUIT

Lawrence W. Langley, and Gilbert Alexander Cotta, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 13, 1966, Ser. No. 601,490
Int. Cl. G01m *3/26;* **F15c** *1/08*
U.S. Cl. 73—45.1 **22 Claims**



A fluidic control circuit for monitoring a fluid signal and providing a fluid output pulse when the amplitude of the monitored signal falls below a predetermined threshold level, the phase of the output pulse being delayed with respect to the time at which the monitored signal falls below the threshold level. When the monitored signal is a train of fluid pulses, there is provided a train of fluid timing pulses having the same frequency as the monitored signal. A pneumatic trigger and NOR gate are combined in a circuit receiving the monitored signal and timing signal to provide an output pulse, the width of which is determined by the width of a timing pulse and the phase of which is determined by the time occurrence of the timing pulse. The addition of a second NOR gate and a fluid flip-flop to the control circuit permits the generation of an output pulse having a width determined by the time between two successive timing pulses, thus providing the control circuit with memory.

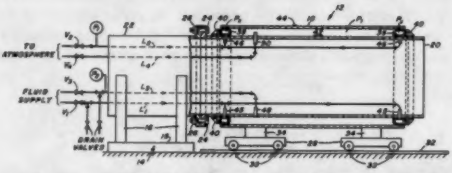
3,731,525

PRESSURE TESTING APPARATUS

Walter Suter, Willoughby Hills, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 13, 1971, Ser. No. 142,868
Int. Cl. G01m *3/28*
U.S. Cl. 73—49.5 **14 Claims**

Apparatus for pressure testing a hollow body at a predetermined testing pressure for areas of weakness is disclosed. The apparatus has frame and a core member mounted on the frame. The hollow body is disposed either about or within the core member. A first sealing member and a second sealing member are mounted on one member of the core member and the hollow body between the core member and the hollow body and define, when pressurized to a predetermined sealing pressure, with the core member and the hollow body a test



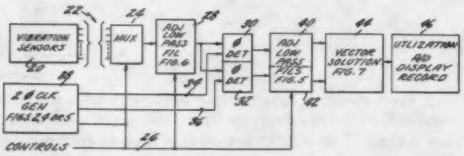
volume for a test area in the hollow body to be tested for areas of weakness. A first pressurizing means inflates the first sealing member and the second sealing member to the predetermined sealing pressure and a second pressurizing means pressurizes the test volume to the predetermined testing pressure.

3,731,526

VARIABLE CENTER FREQUENCY FILTER

John E. Games, Granby, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 5, 1971, Ser. No. 169,391
Int. Cl. G01d
U.S. Cl. 73—71.4 **4 Claims**



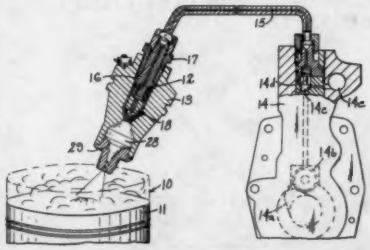
A system for analyzing the frequency response of apparatus such as rotary machinery includes a plurality of vibration sensors which are multiplexed to apparatus utilizing amplitude sensitive phase detection with a two phase clock operating at a selected frequency at which the analysis is to be performed. The two phase-detected waves are passed through vector solution apparatus which provides the summation of the rectified waves and a weighted rectified difference in the rectified waves. Various two phase clock controls and filters are disclosed.

3,731,527

FUEL INJECTION TRANSDUCER AND TIMING SYSTEM

Preston R. Weaver, Rocky Hill, Conn., assignor to UMC Electronics Company, North Haven, Conn.

Filed Nov. 27, 1970, Ser. No. 93,199
Int. Cl. G01m *15/00*
U.S. Cl. 73—119 A **15 Claims**



This disclosure relates to an apparatus for detecting the time of fuel injection into an internal combustion engine and

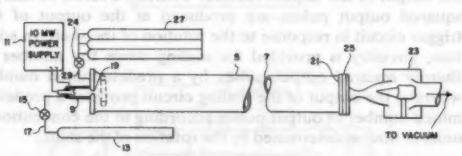
the use of such intelligence in timing the engine. A transducer is mounted in relation to the fuel injection nozzle to sense and detect a shock or sonic wave resulting from opening of the nozzle at the time of injection.

3,731,528

APPARATUS AND METHOD FOR GENERATING LARGE MASS FLOW OF HIGH TEMPERATURE AIR AT HYPERSONIC SPEEDS

William B. Boatright, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed March 9, 1972, Ser. No. 233,098
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 **14 Claims**



High temperature, high mass flow and a high Reynolds number test air flow in the Mach number 8–10 regime of adequate test flow duration is attained by pressurizing a ceramic-lined storage tank with air to a pressure of about 100 to 200 atm. The air is heated to temperatures of 7,000°R to 8,000°R prior to introduction into said tank by passing said air through an electric arc heater. The air cools to 5,500°R to 6,000°R while in the tank and then it is rapidly released through a Mach number 8–10 nozzle.

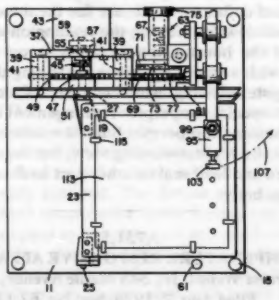
As an embodiment of the invention cold air or hot driver gas under pressure is injected simultaneously with the release of said pressurized hot air and regulated to enter the tank at the same rate the hot air is leaving. This holds pressure in the tank constant during the test. Alternatively, the driver gas is introduced into the tank prior to the discharge of the hot air to thereby increase the pressure in the tank and permit tests at higher pressures than can be handled by the arc heater.

3,731,529

APPARATUS FOR DETERMINING COATING ADHESION PROPERTIES OF HYDROPHOBIC SURFACES

Carl R. Pepmeier; David C. Burke, and Allen P. Jones, all of Fredericksburg, Va., assignors to FMC Corporation, Philadelphia, Pa.

Filed April 26, 1972, Ser. No. 247,822
Int. Cl. G01n *33/26*
U.S. Cl. 73—150 **6 Claims**



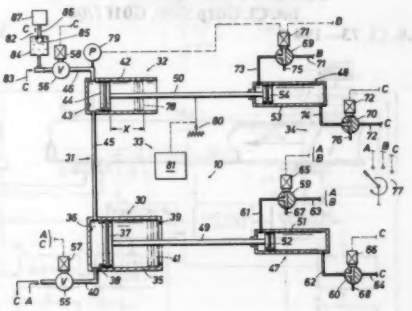
Apparatus for determining the gravitational component of an angle at which a drop of liquid begins to flow down along a surface of a hydrophobic material as such material is urged into an inclined position, with the magnitude of such gravitational component serving as a measure of the expected adhesion of printing inks and other coatings to the surface of such hydrophobic materials.

3,731,530

APPARATUS FOR DETERMINING THE GAS CONTENT OF DRILLING MUDS

Denis R. Tanguy, and Joseph F. Kishel, both of Clarks Summit, Pa., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed March 20, 1972, Ser. No. 236,414
Int. Cl. E21b *49/00*
U.S. Cl. 73—153 **20 Claims**



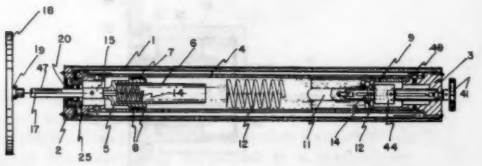
In the representative embodiment of the apparatus of the present invention disclosed herein, first and second selectively-movable pistons are respectively arranged within complementary first and second cylinders having their working chambers in fluid communication with one another to define an expansible sample chamber. Suitable control devices are provided to selectively extend the first piston for inducting a predetermined volume of drilling mud into the sample chamber and thereafter extend the second piston for reducing the pressure in the sample chamber to a predetermined reduced pressure which is preferably somewhat greater than the saturation pressures of any gases which might possibly be entrained in the entrapped mud sample. A suitable measuring device is cooperatively arranged for measuring the extension or displacement volume of the second piston for accurately determining the gas content of the entrapped sample.

3,731,531

MAXOMETERS (PEAK WIND SPEED ANEMOMETERS)

John W. Kaufman; Dennis W. Camp, and Robert E. Turner, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 27, 1971, Ser. No. 212,165
Int. Cl. G01w *1/04*
U.S. Cl. 73—189 **9 Claims**



An instrument for measuring peak wind speeds under severe environmental conditions comprising an elongated cylinder housed in an outer casing. The cylinder contains a piston attached to a longitudinally movable guided rod having

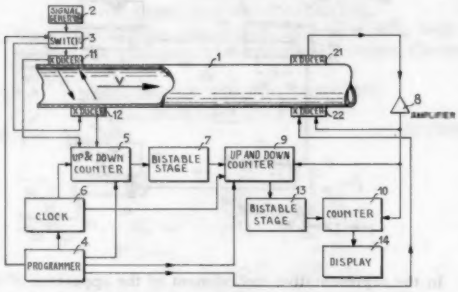
a pressure disk mounted on one projecting end thereof. Wind pressure against the pressure disk depresses the movable rod and thus the piston first against a low rate linear spring and thereafter at peak wind speeds against a high rate spring. When the wind reaches its maximum speed the rod is locked by a ball clutch mechanism in the position of maximum inward movement. Thereafter maximum wind speed or pressure readings may be taken from calibrated indexing means.

3,731,532

ULTRASONIC FLOWMETER AND METHOD OF METERING

Albert Courty, 75 Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 14, 1972, Ser. No. 217,753
Int. Cl. G01p *5/00*; G01f *1/00*
U.S. Cl. 73—194 A **3 Claims**



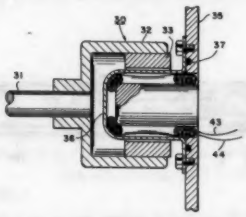
In an ultrasonic flowmeter first ultrasonic signals are caused to traverse in both directions the fluid carrying conduit at an angle with respect to the direction of fluid flow. The times t_1 and t_2 necessary for the signals to traverse in the one and in the other direction are measured. By means of a second ultrasonic signals traversing said conduit normal to the direction of fluid flow in a time t_0 to a train of signal pulses with a periodicity of t_0 is generated for obtaining with the aid of three counters, $(t_2 - t_1)/t_0^2$ which is a measure of the flow rate and from which the uncertain term representing the speed of the ultrasonic signal in the fluid is eliminated.

3,731,533

ELECTRICAL GENERATOR HAVING NON-SALIENT POLES FOR METERING SHAFT ROTATION OF A TURBINE ASSEMBLY

Paul W. Geery, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 866,850, Oct. 16, 1969, Pat. No. 3,636,392. This application Oct. 20, 1971, Ser. No. 191,126
Int. Cl. G01f *1/06*
U.S. Cl. 73—231 R **2 Claims**



A cup-shaped member is attached to a rotating shaft as might be associated with a turbine meter for measuring fluid flow or volume. A permanent magnet ring is mounted internal to the cup member, the ring having a plurality of equispaced alternating north and south poles. A second cup-shaped member is mounted within the permanent magnet ring having a plurality of coils mounted on an iron core therein having non-salient poles, whereby uniform reluctance in the magnetic circuit is maintained regardless of the angular position of the shaft.

In an alternative embodiment, the ring is iron, having the coils mounted thereon, and the permanent magnet is made to rotate in the center portion of the ring.

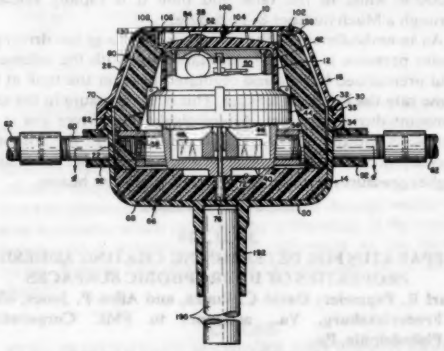
Circuitry is also described to convert the voltage output from the generator into fluid volume indications as dictated by the rotation of the shaft, such circuitry including a first rectifier connected to an alternating voltage, a rechargeable battery connected to the output of the first rectifier, a second rectifier connected to the alternating voltage and a trigger flip-flop circuit powered by the rechargeable battery and connected to the output of the second rectifier whereby a series of sharply squared output pulses are produced at the output of the trigger circuit in response to the rotation of the shaft. In addition, circuitry is provided for scaling down the number of sharply squared output pulses by a predetermined number whereby the output of the scaling circuit provides a predetermined number of output pulses according to the conventional units of flow as determined by the rotation of the shaft.

3,731,534

HOUSING STRUCTURE FOR METERS

Elmer F. Painley; Bernard Last, both of Uniontown, and Joseph B. Dym, Pittsburgh, all of Pa., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed Nov. 18, 1970, Ser. No. 90,684
Int. Cl. G01f *15/10*, *15/14*
U.S. Cl. 73—273 **19 Claims**



A structure for housing a meter and comprising a hollow body having an open end for receiving the meter and a housing top that is detachably screwed on the body to cover the open top and define an enclosure for the meter. The housing top has a window for viewing the reading on a register of the meter, and the housing top is rotatable on the housing to cooperate with a stationary wiper for wiping the interior face of the register-viewing window clear of condensation or moisture. A special tamperproof arrangement interlocking the body and housing top permits limited rotation of the housing top to wipe the register-viewing view, but requires the breaking of a wire and lead seal or other part to detach the housing top from the body.

3,731,535

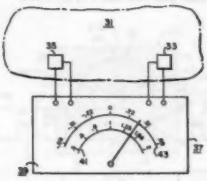
TEMPERATURE RESPONSIVE APPARATUS

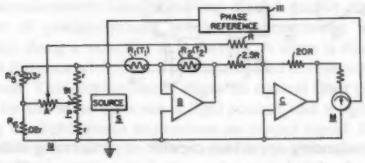
Richard Ernest Wendt, Jr., 348 Maple Avenue, Edgewood, Pa.

Filed Aug. 7, 1970, Ser. No. 62,111
Int. Cl. G01k *7/24*; H01c *7/08*; H01g *7/02*
U.S. Cl. 73—342 **9 Claims**

There is disclosed apparatus for measuring precisely, to 0.01 C°, difference in temperature including thermistors,

which are subject to the temperatures whose difference is being measured. The logarithm of electrical resistance of each thermistor is proportional to its temperature and the thermistors are connected in a ratiometric circuit for measuring their relative resistances. Each thermistor is a ceramic of ferroelectric material (for example, barium-strontium titanate) formed by mixing powders of different compositions,





each composition having a different ferroelectric resistance anomaly, and then firing and oxidizing bodies pressed from the mixture of powders. The mixture of powders is heterogeneous so that the grains of the ceramic include a plurality of particles of powder which microscopically would manifest distinct ferroelectric resistance anomalies if fired alone but the macroscopic response of the ceramic is log-linear over a substantial temperature range.

3,731,536

APPARATUS FOR CONTINUALLY MEASURING THE TEMPERATURE OF A CONTINUOUSLY CAST METAL ROD

Hans G. Baumann, Duisburg, and Heinz Dietrich Schneider, Rheinhausen, both of Germany, assignors to DEMAG Aktiengesellschaft, Duisburg, Germany

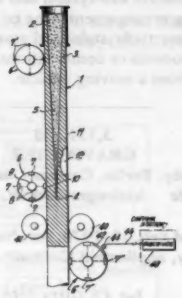
Filed Nov. 13, 1969, Ser. No. 876,379

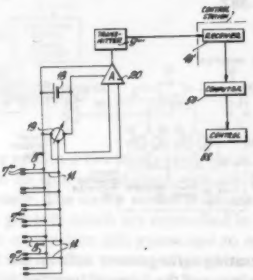
Claims priority, application Germany, Dec. 7, 1968, P 18 13 330.7

Int. Cl. B22d *1/02*; G01k *7/02*, *13/06*

U.S. Cl. 73—351 **9 Claims**

A method and apparatus for continuously measuring the temperature of a metal rod which is continuously cast and as the rod is fed away from its associated casting mold includes a rotating cylinder or wheel having a plurality of temperature sensors arranged at spaced locations around the circumference which engage against the rod at one or more particular locations. The temperature which is sensed is advantageously transmitted either by wire or radio wave to a control station where the information is employed for the regulation of the feeding and molding and subsequent forming of the continuously cast rod. The device advantageously includes an electrical temperature feeler having one feeler element which is adapted to be connected to a segmental contact and another feeler element adapted to be connected to another segmental contact within the cylinder which moves with its circumference in engagement with a side of the cast rod which is formed. A electrical circuit is provided with means for determining the maximum temperature of each of the feeler elements or a specific temperature as desired and for amplifying the indicated value in transmitting it to a control station as desired. The cylinder may be arranged to roll against the rod, for example, at the location of the so-called





sump tip at which the entire rod cross sections begins to solidify.

3,731,537

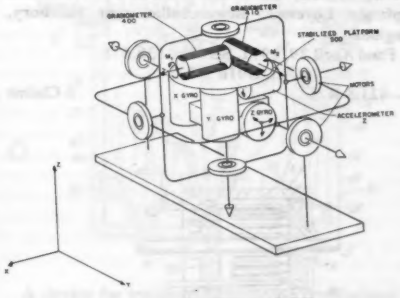
GRAVITY GRADIOMETER

Milton B. Trageser, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 22, 1970, Ser. No. 48,417

Int. Cl. G01v *7/16*

U.S. Cl. 73—382 **9 Claims**



An improved gravity gradiometer and system for use thereof for accurately measuring gravity gradients from moving vehicles. The gradiometer comprises a symmetrically configured float buoyantly supported in a high-density, low-viscosity fluid within a symmetrically configured case of slightly larger size. The instrument is configured and maintained such that the float is neutrally buoyant. Further, the mass of the float is distributed in accordance with the particular gravity gradient sought to be measured. The float is suspended in 6° of freedom via a highly sensitive electric or

magnetic suspension system which, in combination with a feedback control loop, acts to measure the desired component or combination of components of the gravity gradient in a manner described. The gradiometer incorporates a highly precise thermal control sub-system and an extremely sensitive internal balancing arrangement. One or more gradiometers is employed in an inertially stabilized system so as to measure the desired components or combinations of components of the gravity gradient from a moving vehicle.

3,731,538

GRAVIMETER

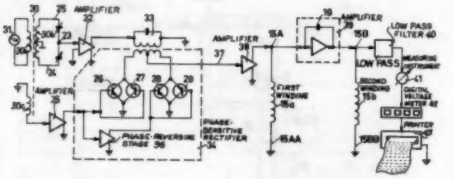
Hans-Dieter Jacoby, Berlin, Germany, assignor to Continental Elektroindustrie Aktiengesellschaft, Berlin-Mariendorf, Germany

Filed Feb. 10, 1970, Ser. No. 10,230

Claims priority, application Germany, Feb. 14, 1969, P 19 08 232.7

Int. Cl. G01v 7/16

U.S. Cl. 73—382 **5 Claims**



A compensating arrangement acts on the mass and is connected to the input of the integral transfer unit of a gravimeter system. The measuring indicator is connected to the output of the integral transfer unit via the compensating arrangement and a low pass filter whereby a signal proportional to the position of the mass is transferred to the compensating arrangement in a manner which compensates for the measuring force in the sense of a negative feedback thereby suppressing the short period accelerating forces acting on the gravimeter system and preventing such accelerating forces from affecting the indication of the measuring indicator.

3,731,539

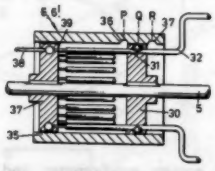
APPARATUS FOR THE COLLECTION AND ANALYSIS OF SAMPLES

Kenneth Walter Brittan, 126 Meadow Lane, Coalsville, and James Ephraim Lovelock, Bowerchalke, near Salisbury, both of England

Filed April 29, 1971, Ser. No. 138,678

Int. Cl. G01n 1/22

U.S. Cl. 73—421.5 R **6 Claims**



An apparatus for the automatic collection and analysis of fluid samples and particularly for the monitoring of atmospheric pollutants. The apparatus comprises a plurality of traps for the collection of samples and which are in turn exposed for a pre-determined time interval to the atmosphere. Thereafter the traps are transferred to an analysis station where pollutant contained in the traps is expelled for analysis into an analytical instrument.

3,731,540

APPARATUS FOR STATIC AND DYNAMIC WHEEL BALANCING

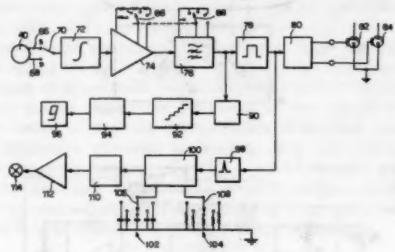
Giovanni Emanuel, and Lucio Bertoni, both of Turin, Italy, assignors to Emanuel-Fi.s.mec. S.p.A. and Ferom S.n.c. di Bertoni Lucio e Ferretti Mario, Turin, Italy

Filed Oct. 14, 1971, Ser. No. 189,115

Claims priority, application Italy, Oct. 27, 1970, 53728 B/70

Int. Cl. G01m 1/22, 1/28

U.S. Cl. 73—457 **5 Claims**



Wheel balancing apparatus capable of performing static and dynamic wheel balancing in a single operation is disclosed. The apparatus has two mutually perpendicular transducers in a sensor which is readily attachable to the suspension of the wheel by means of a magnet or a clamp. The outputs of the sensors are selectively coupled to an amplifier and to an adjustable circuit which provides a stroboscopic illumination triggered by the vibration of the wheel, a visual display of the amount of imbalance of the wheel indicating the weight required to compensate for the imbalance, and an alarm signal if the speed at which the wheel is driven during testing exceeds a preselected maximum value to which the apparatus has been set by the operator.

3,731,541

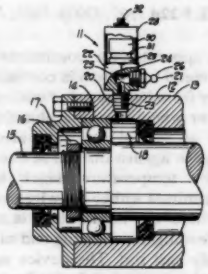
COMBINATION FITTING

Elmer E. Rabek, Westerville, Ohio, assignor to Reliance Electric Company

Filed Jan. 24, 1972, Ser. No. 220,196

Int. Cl. G01h 1/00

U.S. Cl. 73—493 **20 Claims**

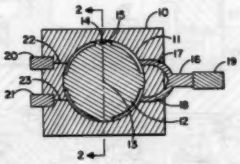


An accelerometer and grease fitting is combined in a single body and has a male pipe thread fitting to thread into the threaded aperture on a machine for a normal grease fitting. In this way a combined accelerometer and grease fitting replaces a normal grease fitting without the need for providing a special mounting of the accelerometer.

3,731,542
OPTICAL ACCELEROMETER

John D. Forsberg, Wayzata, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed March 26, 1971, Ser. No. 128,260
Int. Cl. G01p 15/08
U.S. Cl. 73—516 R 6 Claims

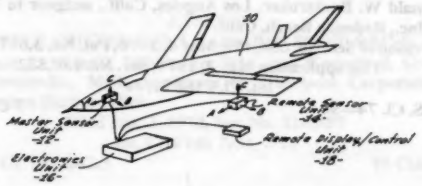


An accelerometer for providing digital output signals indicative of predetermined levels of acceleration in either direction along a sensitive axis therein. A mass is displaced a defined distance whenever a predetermined acceleration is experienced. This displacement aligns an optical fiber path contained by the mass between a light source and a light sensor causing the light sensor to produce an output signal. Different levels of acceleration can be detected by the use of a plurality of optical fiber paths within the mass.

3,731,543
GYROSCOPIC BORESIGHT ALIGNMENT SYSTEM AND APPARATUS

Robert L. Gates, Littleton, Colo., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 28, 1972, Ser. No. 221,694
Int. Cl. G01c 19/02
U.S. Cl. 73—504 7 Claims

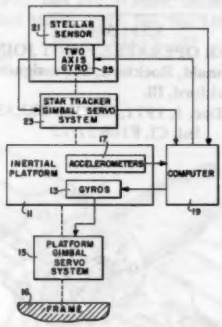


An improved system is provided for determining boresight misalignments of equipment, such as guns, radar antennas, cameras, gunsights, rocket launch rails, and the like, of carrier-based aircraft. The system of the invention utilizes intertial sensors which respond to the rotational rates of the aircraft carrier itself, and which use such rates as signal sources for the determination of angular boresight misalignments with respect to the armament data reference line of the particular aircraft. The system of the invention comprises a master sensor unit which contains two gyroscopes, and which is mounted on the aircraft during the test in position to extend along the armament data reference line. The system also includes a remote sensor unit which contains a single gyroscope, and which is mounted during the test on the actual equipment whose boresight misalignment is to be measured with respect to the aforesaid armament data reference line. The system of the invention compares the angular rates of the aircraft at the data line and at the equipment boresight axis to determine any misalignments of the boresight axis with respect to a parallel relationship with the armament data line.

3,731,544
STAR TRACKER SYSTEM

Robert H. Acker, Packanack Lake, and Francis H. Murphy, Butler, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed March 31, 1971, Ser. No. 129,750
Int. Cl. G01c 19/02; G01j 1/20
U.S. Cl. 74—5.22 6 Claims

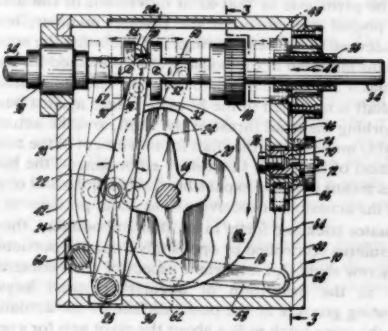


In a star tracker system a two axis gyroscope is fixed to the stellar sensor with its spin axis aligned with the line of sight with the stellar sensor. The stellar sensor is mounted on an inertial platform by gimbals which are controlled in response to the output signals of the two axis gyroscope to maintain the line of sight of the stellar sensor aligned to an inertial reference frame. The line of sight of the stellar sensor is changed to a new position by torquing the gyroscope.

3,731,545
DEVICE FOR TRANSMITTING ACCURATE TRANSLATIONAL AND ROTARY MOVEMENTS

Earl F. Beezer, One Andrea Boulevard, Saddle Brook, N.J.

Filed May 4, 1971, Ser. No. 140,134
Int. Cl. F16h 27/04
U.S. Cl. 74—24 18 Claims



A device for transmitting accurate translational and rotary movements includes a rotary input shaft on which is mounted a rotary driving cam which is engaged with a pivotal follower carried on a first lever member intermediate its length. The first lever member is pivoted at its lower end in the housing containing the cam, and its upper end is engaged with the output shaft. The output shaft is guided in rotary roller bearings and linear ball bearings and it is shifted laterally, backwardly, and forwardly by pivotal movement of the first lever as its follower rides in the cam. A second gear control lever is pivotally mounted in the housing to extend transversely in respect to the first lever and it includes a follower which is also engaged

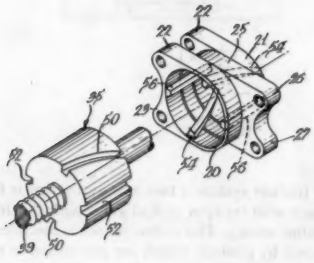
in a groove of the cam and this causes the pivotal movement of the second lever. The outer end of the second lever is pivotally connected to a connecting rod which in turn is connected to a gear member in the form of a quadrant through a universal joint connection. The gear member or quadrant meshes with a gear carried on the output shaft to rotate the output shaft. Meshing engagement is only effective when the output shaft moves a predetermined distance transversely so that meshing engagement with the quadrant can be easily effected.

3,731,546

POWER OPERABLE PIVOT JOINT

J. G. Fraser MacDonald, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 1, 1971, Ser. No. 203,532
Int. Cl. F16h *21/12*
U.S. Cl. 74—63 **31 Claims**



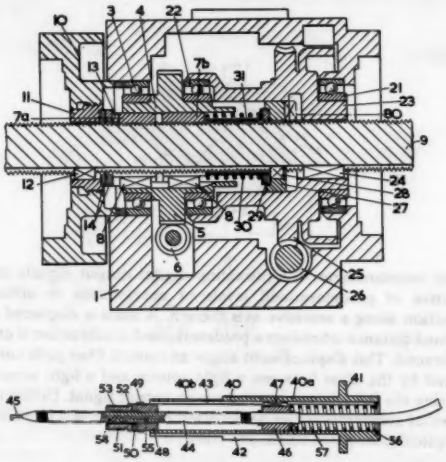
A power operable pivot joint for mounting and actuating a trailing edge flap or the like on an airplane wing, including a pair of laterally spaced bearing rings having outwardly projecting support arms adapted to be secured to an airplane wing, an annular member pivotally mounted on the bearing rings for movement about a pivot axis and having a outwardly projecting arm adapted to be attached to a wing flap, a set of angularly spaced keys disposed in the bearing rings and secured thereto, a set of angularly spaced keys disposed in the pivoted member and secured thereto, an actuator disposed in the bearing rings and pivoted member and having angularly spaced guide grooves respectively cooperating with said keys, one of the sets of keys and cooperating grooves being helical about the pivot axis so that axial movement of the actuator causes pivotal movement of the pivoted member, housing means secured to the bearing rings and enclosing the actuator, and means mounted in the housing and connected for moving the actuator axially of the pivot axis. In one embodiment, a screw shaft is mounted in the housing means against bearings for absorbing the axial thrust of the shaft, and the actuator is threadably mounted on the shaft for movement of the actuator on rotation of the shaft. In another embodiment, the housing includes means defining expansible fluid chambers at opposite ends of the actuator for receiving fluid under pressure to move the actuator back and forth. In another embodiment, there are dual actuators controlled by oppositely threaded portions on a single screw shaft. An important aspect of each construction resides in the utilization of angularly spaced keys and cooperating grooves at the outer surface of the actuator, all having the same pitch radius about the pivot axis for even distribution of the loads.

3,731,547

TRAVERSING MECHANISMS

Douglas Joseph Fullbrook, Aldershot, England, assignor to National Research Development Corporation, London, England

Filed Sept. 21, 1970, Ser. No. 74,103
Claims priority, application Great Britain, Sept. 22, 1969, 46,470/69; Dec. 2, 1969, 58,802/69
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **22 Claims**



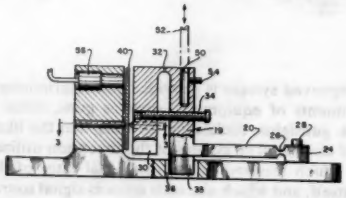
A traversing mechanism is capable of traversing any one of a number of differently sized leadscrews, which may carry probes, maintaining an accuracy which is substantially constant relative to the size of the traverse. One leadscrew is installed directly in the mechanism, others are contained in cartridges which are installed in the mechanism and are connected to the traversing means of the mechanism. The disclosure also teaches how the mechanism may be adapted to traverse a remotely situated probe, or leadscrews too large to be directly installed therein. A method of using two traversing mechanisms to provide a two dimensional traverse is also described.

3,731,548

LINEAR DISPLACEMENT AMPLIFICATION DEVICE AND DEFLECTION TRANSDUCER EMBODYING SAME

Ronald W. Bocksruker, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 034,459, May 4, 1970, Pat. No. 3,617,964.
This application May 3, 1971, Ser. No. 139,832
Int. Cl. F16h *21/44*
U.S. Cl. 74—96 **5 Claims**

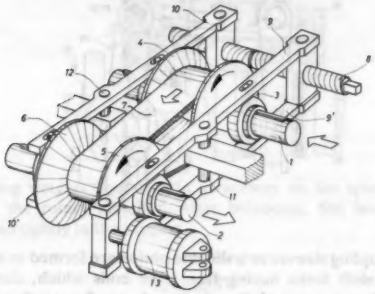


A linear displacement amplification device having fulcrum means rockably engaging opposite sides of a lever in a common plane normal to the longitudinal axis of the lever and restrained against sliding movement along the lever, and means supporting one fulcrum, means for movement lengthwise of the lever relative to the other fulcrum means in response to a linear input displacement. This relative movement of the fulcrum means causes lateral displacement of one end of the lever proportional to but substantially greater than the input displacement. A deflection transducer embodying the linear displacement amplification device for producing an electrical output representing the amplified input displacement.

3,731,549
INFINITELY VARIABLE TRANSMISSION

Wilhelm Kaiser, Angermund; Wolfgang Meurer, Buderich, and Georg Muller, Dusseldorf, all of Germany, assignors to Jagenberg-Werke AG, Dusseldorf, Germany

Filed June 7, 1971, Ser. No. 150,328
Claims priority, application Germany, June 19, 1970, P 20 30 184.2; Dec. 17, 1970, P 20 62 170.9
Int. Cl. F16h *9/00*
U.S. Cl. 74—230.17 A 7 Claims

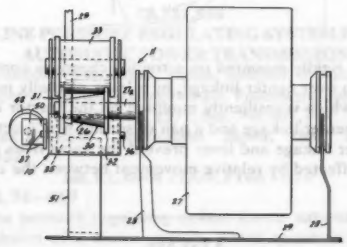


In an infinitely variable speed transmission comprising a pair of transmission shafts one of which drives and the other of which is driven, two pairs of conical disks respectively carried on said pair of shafts, a transmission chain operatively connecting said pair of disks, and means for adjusting the spacing between the disks of each pair and thereby infinitely vary the transmission ratio, there is provided a piston-cylinder which applies a counter-force either against the transmission chain or the means for adjusting the spacing between a pair of disks. The counter-force is controlled by the load on the driven transmission shaft and is especially intended to ensure constant transmission ratio as is needed in cutting machines wherein the length of material between cuts must be identical.

3,731,550
BELT SHIFTER FOR A VARIABLE SPEED DRIVE

Ronald J. Malecki, Milwaukee, Wis., and Kenneth J. Grall, Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 3, 1972, Ser. No. 214,757
Int. Cl. F16h *7/08, 7/18*
U.S. Cl. 74—242.3 10 Claims

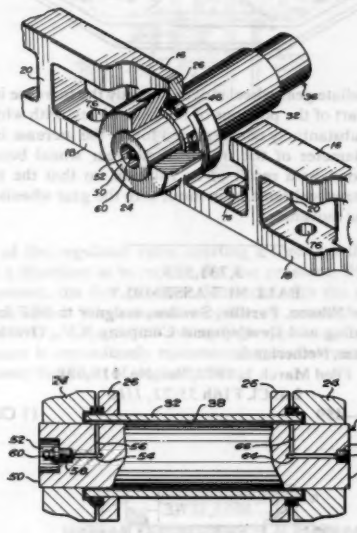


A belt shifting device used with a variable speed drive system for a clothes dryer. The drive system has a drive pulley with an axially extending tapered drive surface and a belt engaging the drive surface and extending around an external surface of the dryer drum. The belt shifter utilizes a guide roller which frictionally engages the belt and is movable between two oblique positions on opposite sides of a line extending perpendicular to an edge of the belt with movement between the two positions causing the belt to shift positions on the drive pulley to change the linear speed of the belt and therefore the speed of rotation of the dryer drum.

3,731,551
LUBRICATION SEAL FOR A CRAWLER TRACK

Bill W. Nelson, P.O. Box 212, Wasilla, Alaska

Filed May 6, 1971, Ser. No. 140,701
Int. Cl. F16g *13/02*
U.S. Cl. 74—257 14 Claims



A track for a crawler vehicle comprises track assemblies. The adjacent or successive track assemblies are connected together by a bushing and a pin in the bushing. The bushing and pin are free to rotate with respect to each other.

The bushing and pin, because of their relative movement with respect to each other, wear. The metal to metal contact of the bushing and pin wear each other. Also, the track in a crawler vehicle moves over and through dirt, mud and in muddy water. The dirt, mud and silt and the muddy water work in between the bushing and the pin. As a result, there is considerable wear between the bushing and the pin. Consequently, there is a shortened life for the track.

This invention is directed to a lubrication system for the bushing and the pin. This lubrication system decreases the wear between the bushing and the pin and, consequently, lengthens the life of the track.

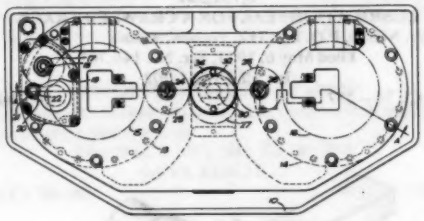
3,731,552
DIFFERENTIAL GEAR MECHANISMS

Cecil Goodacre, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, England

Filed Feb. 10, 1972, Ser. No. 225,184
Claims priority, application Great Britain, Feb. 12, 1971, 4,578/71
Int. Cl. F16h *35/02*
U.S. Cl. 74—393 6 Claims

A differential gear mechanism comprises two spaced gear wheels in mesh with an intermediate gear wheel disposed between them, the intermediate gear wheel being arranged, so

it rotates, to move laterally between the gear wheels so as to effect differential rotation of the gear wheels. The intermediate gear wheel is elliptical, the minor axis of the ellipse lying along a line joining the centers of the gear wheels when the intermediate gear wheel is symmetrically disposed between them. The eccentricity of the ellipse is such that as



the intermediate gear wheel moves laterally the increase in the distance apart of the portions of the gear wheels with which it meshes is substantially compensated for by the increase in the effective diameter of the intermediate gear wheel between those portions, as a result of its rotation, so that the intermediate gear wheel remains in mesh with the gear wheels during its lateral movement.

3,731,553

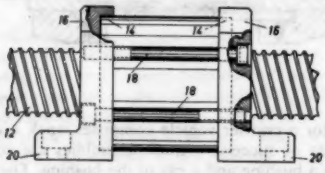
BALL NUT ASSEMBLY

Sven Walter Nilsson, Partille, Sweden, assignor to SKF Industrial Trading and Development Company N.V., Overtoom, Amsterdam, Netherlands

Filed March 1, 1971, Ser. No. 119,658

Int. Cl. F16h *55/22, 1/18*

U.S. Cl. 74—459 **11 Claims**



In order to make possible a simplified manufacture of a ball nut assembly with special consideration to a desire to reduce the number of types necessary for inclusion in machineries of various kinds, the nut is produced in three main parts, viz: a nut body provided with ball recirculating means and two end pieces. The latter can easily be designed in various ways to suit the intended use, but the complicated component, i.e. the nut body can remain the same and thus be manufactured as a standardized unit.

The components are secured together by means of stay bolts in such a manner that a turning of the nut body in relation to the end pieces is prevented.

3,731,554

GEARSHIFT ARRANGEMENT FOR A MOTOR VEHICLE CHANGE-SPEED GEAR

Rolf Renk, Russelsheim, Main, Germany, assignor to General Motors Corporation, Detroit, Mich.

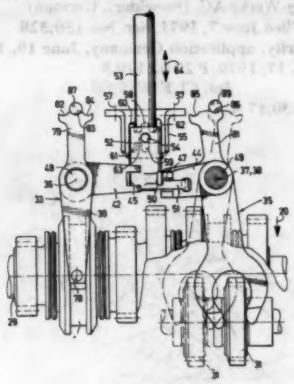
Filed Nov. 24, 1971, Ser. No. 201,796

Claims priority, application Germany, Dec. 19, 1970, P 20 62 691.9

Int. Cl. G05g *9/12*

U.S. Cl. 74—477 **8 Claims**

A gearshift arrangement for a motor vehicle change-speed gear, primarily for use with a transversely mounted engine, includes a manual gearshift lever articulated to a selector shaft that is mounted for selective longitudinal displacement and rotary movement. Shift forks are effecting movement of slidable



shift coupling sleeves or a slidable pinion are formed as angled pivotal shift forks having free lever ends which, during a gearshift, are engaged directly by selector fingers that effectively form part of the selector shaft.

3,731,555

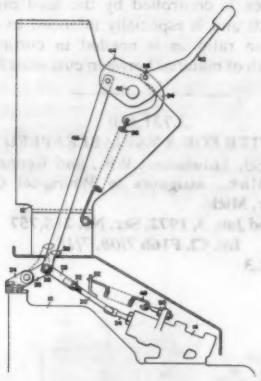
VALVE CONTROL LINKAGE

Karl Heinz Fresmann, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed April 7, 1972, Ser. No. 242,163

Int. Cl. G05g *1/00*

U.S. Cl. 74—491 **7 Claims**



A valve rigidly mounted on a tractor chassis is controlled, through an over center linkage, by a lever pivotally mounted on a cab which is resiliently mounted on the tractor chassis. The over center linkage and a pair of springs which act on the over center linkage and lever prevent the valve from sensing or being affected by relative movement between the cab and chassis.

3,731,556

DYNAMIC BALANCING APPARATUS

Jacob Decker, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

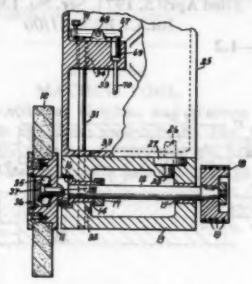
Filed Nov. 17, 1971, Ser. No. 199,435

Int. Cl. F16f *15/32*

U.S. Cl. 74—573 **8 Claims**

A dynamic balancing apparatus for a rotary member, such as a grinding wheel, supported for rotation on a spindle jour-

naled in a spindle housing. The spindle housing is pivoted on a support for rocking movement under the control of a resilient restraining means. Balancing is effected by the release of self-



adjusting weights operating in a raceway on the spindle adjacent the rotary member. After balancing, the housing is clamped tightly to the support.

3,731,557

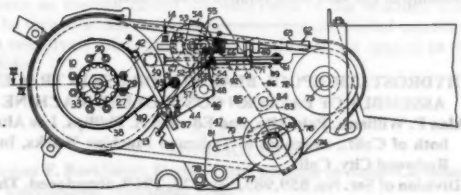
PLANETARY TRANSMISSION

Igor Kamlukin, Mequon, and Peter P. Konyha, Port Washington, both of Wis., assignors to Simplicity Manufacturing Company, Inc., Port Washington, Wis.

Filed March 29, 1972, Ser. No. 239,245

Int. Cl. F16h *57/10, 15/00, 11/02*

U.S. Cl. 74—792 **8 Claims**



This invention is concerned with the combination of a spur gear planetary transmission and a split sheave power input clutched by a V-belt.

3,731,558

LINE PRESSURE REGULATING SYSTEM FOR AUTOMATIC POWER TRANSMISSION

Koji Enomoto, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama, Japan

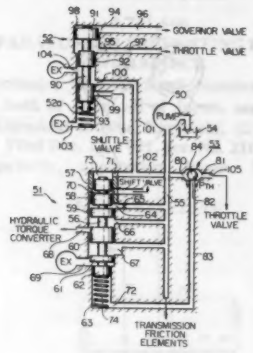
Filed Dec. 14, 1971, Ser. No. 207,749

Claims priority, application Japan, Dec. 18, 1970, 45/113221

Int. Cl. B60k *21/00;* **F16h** *57/10*

U.S. Cl. 74—867 **8 Claims**

A line pressure regulating system for an automatic power transmission of a motor vehicle, which system comprises a regulator valve having an axially movable spool and adapted to regulate the output pressure of an engine driven fluid pump, a modulator valve responsive to governor pressure and throttle valve pressure for providing a modulator valve pressure to the regulator valve, and a ball valve responsive to the throttle valve pressure and modulator valve pressure for furnishing the regulator valve with the higher one of the throttle valve pressure and modulator valve pressure. The modulator valve pressure is kept at zero level at low vehicle speeds and in speed of "R," but is maintained at a level equal to the throttle valve pressure in position "D" and to the line pressure in any of "1", "2" and "3" both at high vehicle speeds. During the drive position "D," when the transmission upshifts to the fourth forward drive ratio, the line pressure is applied to an additional



port of the regulator valve exerting a force on the spool in such a direction as to reduce the line pressure. With this arrangement, the line pressure decreases with the increase of vehicle speed. When the selector lever is moved from "D" to any of "1", "2" and "3" during high speed running, the line pressure is immediately maintained at an increased level to augment the effect of engine braking.

3,731,559

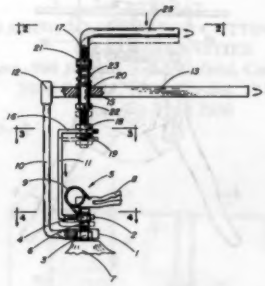
UNITARY DUAL-WRENCH TOOL

Richard V. Krupke, 17 West 18th Street, Merced, Calif.

Filed Dec. 27, 1971, Ser. No. 212,589

Int. Cl. B25b *9/00, 13/48*

U.S. Cl. 81—3 F **7 Claims**

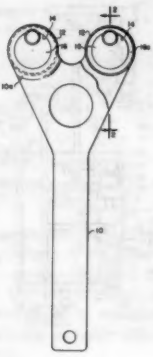


A hand tool including superposed open-end wrenches adapted for ready and effective engagement—at the same time, and in clearance relation to adjacent obstructions—with the lock nut and valve clearance adjustment nut, respectively, of a rocker arm assembly of an overhead cam engine; the tool providing, in unitary combination with the wrenches, hand-manipulated parts by means of which the wrenches are selectively and independently operated from a point a distance thereabove.

3,731,560
ADJUSTABLE SPANNER WRENCH

James D. Bares, Gates Mills, Ohio, assignor to Milbar Corporation, Chagrin Falls, Ohio

Filed Oct. 20, 1971, Ser. No. 190,754
Int. Cl. B25b 13/00
U.S. Cl. 81—90 C 7 Claims

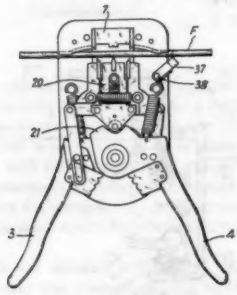


A spanner wrench has a Y-shaped body with a pair of rotatable members disposed in the legs of the Y. Each member has a pin carried thereby spaced from the axis. Upon rotation of the members the spacing between the pins is changed to enable them to engage in holes differently spaced from each other.

3,731,561
MECHANISM FOR SEVERING AND SIMULTANEOUSLY STRIPPING WIRES COVERED BY A SHEET

Emile R. Mongredien, Epinay-sur-Seine, France, assignor to La Telemecanique Electrique, Marechal Joffre Namterre (Hauts-de-Seine), France

Filed May 25, 1971, Ser. No. 146,757
Int. Cl. H02g 1/12
U.S. Cl. 81—9.5 A 12 Claims

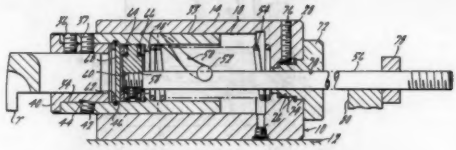


The invention discloses a mechanism, for incorporation into a hand-operated tool, for severing, and stripping the ends of, a sheath-covered wire, e.g. an insulated electric conductor. Two cammed handles push a movable block towards a stationary block, the former having a central severing blade and two lateral stripping knives registrable with lateral knives on the stationary block. After cutting the sheath, a lost-motion connection between the handles and the movable block causes the movable knives to pivot outwardly and to expel the stripped ends of the severed wire. The invention enables the simultaneous severing, and stripping the severed ends of, a wire anywhere along its length.

3,731,562
RECESSING TOOL

Helmut C. Heuser, Birmingham, Mich., assignor to Bokum Tool Company, Inc., Madison Heights, Mich.

Filed April 5, 1971, Ser. No. 130,883
Int. Cl. B23b 41/00
U.S. Cl. 82—1.2 3 Claims

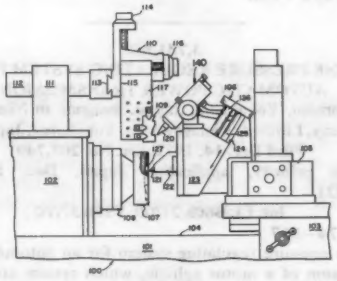


A recessing tool for forming an annular recess within a cylindrical opening in a workpiece, intended for use on an automatic screw machine, having a holder, a cam body carried by said holder for relative angular movement about an axis parallel to but displaced from the axis of relative rotation between the holder and work piece and for relative axial movement between the holder and cam body. Cam means are interposed between said holder and cam body effective upon relative axial displacement therebetween to produce relative angular movement therebetween, and means for effecting longitudinal movement of the holder to project a recessing tool carried by the cam body into a cylindrical opening in a work piece. A drawbar is connected to the cam body and abutment means acting between the drawbar and the support for the holder arrests forward movement of the cam body while the holder continues to move in a direction parallel to the axis of the bore in the work piece. This displaces a recessing tool carried by the cam body outwardly of the axis of relative rotation between the holder and work piece, due to the eccentric relationship of the cam body relative to such axis.

3,731,563
HYDROSTATIC SPOOL BEARING FOR USE IN TRACER ASSEMBLY OF PATTERN CONTROLLED MACHINE

Alan F. Williams, Palo Alto, and Edward H. Phillips, Los Altos, both of Calif., assignors to Tydeman Machine Works, Inc., Redwood City, Calif.

Division of Ser. No. 859,985, Sept. 22, 1969, abandoned. This application Nov. 4, 1971, Ser. No. 195,883
Int. Cl. B23b 3/28
U.S. Cl. 82—14 A 2 Claims



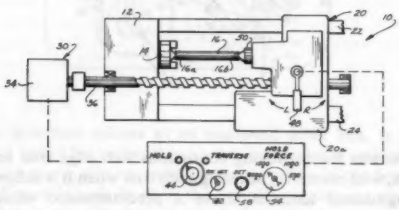
A spool bearing for cartridge spindles and the like has a hollow tubular barrel with a central fluid inlet and a spool shaft mounted in the hollow barrel for rotation. The spool shaft has a relieved central portion adjacent to the fluid inlet into the barrel and a pair of stepped lands on its opposite ends whereby

pressurized fluid from the inlet will flow generally in an axial direction over the lands at opposite ends of the spool shaft and support it on a fluid film bearing within the barrel. A hydrostatic thrust bearing can be incorporated on one end of the spool shaft for resisting the axial loadings induced on the shaft spool by tools mounted on its other end.

3,731,564
MACHINE TOOL

Robert E. Diener, Shaker Heights, and Warren E. Dowling, Cleveland, both of Ohio, assignors to The Warner and Swasey Company, Cleveland, Ohio

Filed Dec. 21, 1970, Ser. No. 100,248
Int. Cl. B23b *23/00*
U.S. Cl. 82—31 **14 Claims**

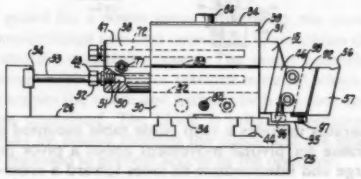


An improved machine tool has a tailstock which is moved along a bed by a drive assembly which includes a screw driven by an electrical torque type motor. A relatively large setting or jamming force is used to initially lock a workpiece in the machine tool. During operation of the machine tool, the motor is maintained in a stalled condition in which it produces a holding torque which urges the tailstock against the workpiece to thereby clamp the workpiece in the machine tool. The torque which the motor produces in the stalled condition is selectively adjustable by varying the voltage applied to the motor.

3,731,565
TOOLHOLDER

Ernest F. Barkhurst, Euclid, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Aug. 31, 1970, Ser. No. 68,109
Int. Cl. B23b *25/06*
U.S. Cl. 82—34 R **21 Claims**

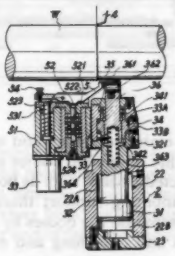


A standard toolholder is disclosed to be mounted on any one of the several cross-slides of an automatic screw machine having uniform distance between the slide mounting surface and the cutting plane parallel thereto. The toolholder assembly includes a holder base receiving a cylindrical shank of a tool-holder on the front of which is mounted any one of a variety of tools, such as dovetail, circular, flat, cut-off, shaving, knurling, burnishing, stenciling, single roll threading, recessing and boring tools. Such toolholder assembly provides standardized mounting heights for all such types of tools and provides for straight or off-set mounting of the toolholder relative to a perpendicular or in line to the spindle axis. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,731,566
REST APPARATUS FOR PREVENTING BENDING OF A WORKPIECE

Miksihi Kurimoto, Nagoya; Kenji Nomura, and Hiromichi Onouchi, both of Aichi, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariyashi, Aichi-ken, Japan

Filed Dec. 22, 1971, Ser. No. 210,732
Claims priority, application Japan, Dec. 22, 1970, 45/124239
Int. Cl. B23b *25/00*
U.S. Cl. 82—38 R **6 Claims**

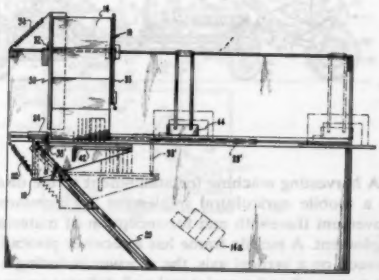


A rest apparatus for supporting a workpiece of any diameter to prevent bending thereof during a machining operation features a rest shaft engageable with the workpiece and a piston for moving the rest shaft being telescopically arranged therewith. The position of the piston is controlled by a servo-valve actuated by a solenoid-operated stylus which may engage the workpiece. When a preselected relationship between the stylus and the servo-valve is properly established, the rest shaft is tightly clamped while engaging the workpiece so that the workpiece may be positively supported thereby.

3,731,567
METHOD AND A MACHINE FOR CUTTING OPEN ENDED OR BLIND CAVITIES

Cray L. Ross, 309 Jackson Road, Enfield, Conn.

Filed Oct. 21, 1971, Ser. No. 191,383
Int. Cl. B26d *3/00*
U.S. Cl. 83—1 **6 Claims**



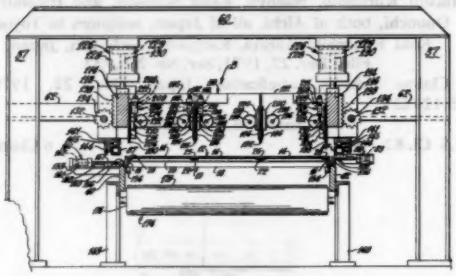
A method and a machine for cutting open ended or blind cavities in a block of material to fit merchandise having an irregular shape, by using a heated wire die to be inserted into, move laterally within and removed from block of the material.

3,731,568

METHOD AND APPARATUS FOR PROCESSING MOLDED BODIES

Gregory C. Brock, Jr., and Ulysses T. Gambill, both of Granville, Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Jan. 26, 1971, Ser. No. 109,873
Int. Cl. B26d 7/06, 7/18
U.S. Cl. 83—23 21 Claims



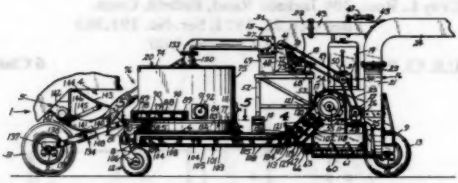
The disclosure embraces a method of and apparatus for processing a plurality of molded bodies and involves feeding a plurality of connected bodies, such as bodies of mineral fibers and a portable mounting support therefor to a facility arranged to strip or separate the bodies by severing connections joining the bodies and detaching and removing the severed discrete bodies from the mounting support.

3,731,569

HARVESTING MACHINE

John W. Quanrud, 1538 5th Avenue N.W., Jamestown, N. Dak.

Filed May 13, 1971, Ser. No. 143,132
Int. Cl. A01d 55/00, 57/00; B26d 5/20
U.S. Cl. 83—356.3 8 Claims



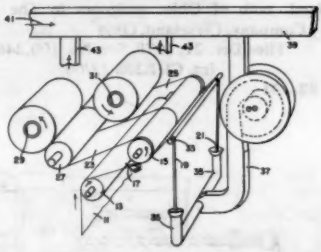
A harvesting machine for attachment to the discharge end of a mobile agricultural implement for common traveling movement therewith and for reception of material from the implement. A mobile frame has a receiver pivotally mounted thereon on a vertical axis, the receiver including a hood having a top wall and a peripheral wall defining an open front. A draft frame is utilized to pivotally connect the mobile frame to the implement through the receiver and permits vertical movements of the frame and parts carried thereby relative to the implement while holding the receiver against pivotal movements on said vertical axis relative to the implement.

3,731,570

TRIM TENSIONING LIMITER

Seddon C. Nelson, Fredericksburg, Va., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 4, 1971, Ser. No. 185,961
Int. Cl. B26d 5/38
U.S. Cl. 83—370 10 Claims



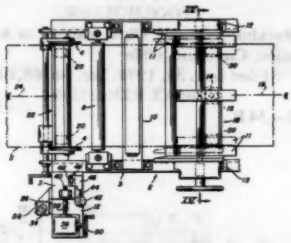
Apparatus for conveying continuous web edge trim under tension, with means for severing such trim when it is subjected to longitudinal tensions above a predetermined value to thereby prevent the travel of excessive tensions back to locations at which web trimming is being effected.

3,731,571

ADJUSTABLE GUIDE TABLE FOR STRIP APPROACHING A CROSS-CUT SHEAR

Robert W. Larson, McKeesport, and Glen E. Morris, Elizabeth Township, Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1971, Ser. No. 211,516
Int. Cl. B26d 7/06
U.S. Cl. 83—420 4 Claims



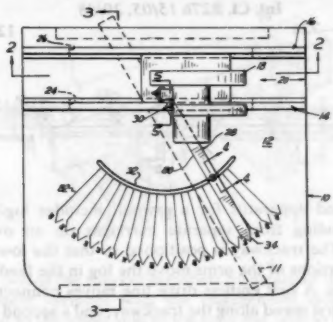
Apparatus includes a strip guide table mounted on a fixed base frame for pivotal movement about a pivot point at its discharge end intermediate its sides toward a cross-cut shear in a strip processing line. Means are connected with the entry end of the table for pivoting the table to correct for camber or other irregularity in the strip shape so that the strip approaches the cross-cut shear at right angles after it leaves the guide table. An indicator means is mounted on the base frame in engagement with the guide frame. The indicator mean is calibrated to indicate the variation of the longitudinal centerline of the guide table from the longitudinal centerline of the processing line so that it can be ascertained when the guide table is in proper position for correcting for the amount of camber or other irregularity in the strip and to cause the strip to approach the cross-cut shears at right angles thereto.

3,731,572

MITER BOX

Richard S. Crooks, 2277 Newman Dr., Trenton, Mich.

Filed Sept. 28, 1970, Ser. No. 75,900
Int. Cl. B27b 27/08
U.S. Cl. 83—471.3 7 Claims



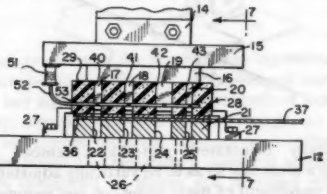
The invention relates to an improved miter box. It comprises a board for supporting a work piece that is underneath the work piece; an arm rotatable on the plane of the board; a pair of parallel rails fixed to the board for guiding a circular saw; slots in the rails through which the work piece passes; the work piece being guided along the arm towards the saw; means on the board for designating the angle of the arm with the path of the saw; and means fixing this angle by selectively maintaining a rigid connection between the arm and the board.

3,731,573

SAFETY GUARD FOR FABRICATING APPARATUS

Earl M. Jahnke, 188 Berkley Avenue, Elmhurst, Ill., and Robert Miller, 63 W. 73rd St., Darien, Ill.

Filed Feb. 22, 1972, Ser. No. 227,912
Int. Cl. B26d 5/08
U.S. Cl. 83—544 10 Claims



A safety guard for a power press is provided, the press including a conventional ram and upper and lower plates defining a tool and die containing space. The guard comprises a block of sponge rubber or other resilient material which substantially occupies the space and within which the tool and die elements are contained. The block is suitably apertured so that work may be passed through the space and the space is completely enclosed to prevent access by the operator.

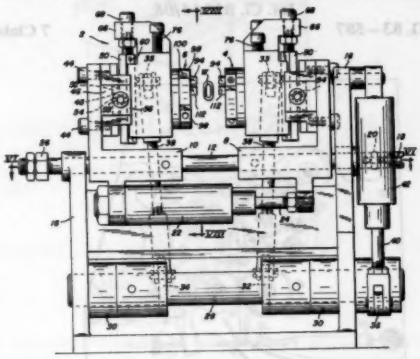
3,731,574

APPARATUS FOR CUTTING LENGTHS OF CONVOLUTED PICKET WIRE FROM A CONTINUOUS STRAND THEREOF

Paul McCarthy, and John F. Nelson, both of Concord, Calif., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 6, 1971, Ser. No. 208,718
Int. Cl. B26d 5/02
U.S. Cl. 83—558 11 Claims

Apparatus includes a pair of shear heads mounted astride a continuous length of convoluted picket wire for linear movement toward and away from the strand. Each of said shear heads being provided with a rotatable cutting blade and a fixed cutting blade positioned to engage a common convolution of the strand at two separate points and cutting away a portion of the convolution to cut away a length of picket wire from the strand when the rotatable cutting blades are rotated. Such cutting operation simultaneously forming a tail end on the length of wire cut away from the continuous strand and a head end on the leading end of the continuous strand.

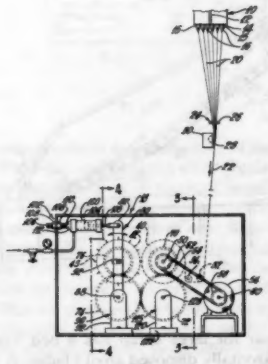


3,731,575

CHOPPER FOR LINEAR MATERIAL

Robert J. Gelin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Continuation of Ser. No. 850,780, Aug. 18, 1969, abandoned.
This application Nov. 8, 1971, Ser. No. 196,660
Int. Cl. B23d 25/12; C03b 37/02
U.S. Cl. 83—344 8 Claims



Apparatus for severing continuous linear material into discontinuous lengths where the apparatus urges two rolls toward each other into cutting engagement and includes a stopping arrangement limiting the extent of movement of the rolls toward each other.

3,731,576

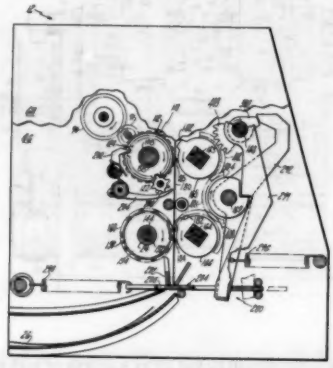
SHEARING MECHANISM

Bruno S. Smilgys, Hartford, Conn., and Robert C. Ritchie, Feeding Hills, Mass., assignors to Veeder Industries Inc., Hartford, Conn.

Continuation of Ser. No. 80,260, Oct. 13, 1970, Pat. No. 3,668,375. This application June 2, 1972, Ser. No. 259,284

Int. Cl. B26d *5/08*

U.S. Cl. 83—587 **7 Claims**



A spring actuated reciprocable shearing member having a spring biased actuator for resetting the shearing member in a retracted position and a latch for holding the shearing member in the retracted position. In the cutting operation, the actuator is first withdrawn against the bias of its spring and then the shearing member is actuated by its spring upon release of the latch.

3,731,577

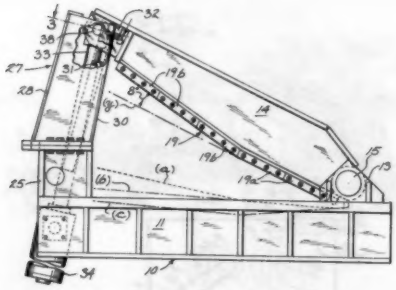
ALLIGATOR SHEARS

Albert G. Swint, Jr., Cordele, Ga., assignor to Julius L. Chazen, Chattanooga, Tenn.

Filed March 15, 1971, Ser. No. 123,992

Int. Cl. B26d *5/12*

U.S. Cl. 83—599 **1 Claim**



An alligator shear for large scrap has a bed with widely spaced sets of horizontally disposed anvil blades. A wide jaw pivoted to the bed has shearing blades on opposite sides, which blades extend at a predetermined angle for part of the length of the knife beam and at a greater angle for the remainder of the length of the beam for coaction with the spaced sets of anvil blades on the bed to provide a double cut, there being fluid pressure operated cylinders pulling down on the jaw and there being a closed U-shaped guide for the front end of the jaw resisting thrust from either direction.

3,731,578

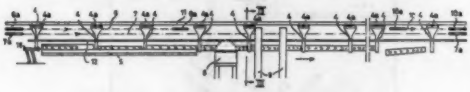
SAWING SYSTEM FOR SAWING OF LOGS SORTED TO DIAMETER CLASS

Bo Ingemar Ackerfeldt, Ascona, Switzerland, assignor to U.S. Natural Resources, Inc., Portland, Oreg.

Filed Dec. 10, 1971, Ser. No. 206,788

Int. Cl. B27b *15/05, 29/08*

U.S. Cl. 83—731 **12 Claims**



Log infeed apparatus for a sawmill includes log-holding arms depending from separate carriages on an overhead trackway. The trackway is positioned so that the lower, log-gripping portions of the arms move the log in the feeding line for the saws. A first endless drive line moves connected carriages at a first speed along the trackway, and a second endless drive line moves connected carriages at a second speed greater than the first speed along the trackway to facilitate the gripping and release of logs by the arms. Each log-holding arm has both a fore log-gripping device facing in the infeed direction and a rear log-gripping device facing in the opposite direction so that a single arm can support opposite ends of two longitudinally adjacent logs in the feeding line.

3,731,579

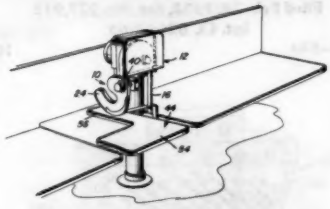
TRIMMING GUIDE FOR MEAT

Herman F. Russell, 13900 Cherrylawn, Detroit, Mich.

Filed April 13, 1971, Ser. No. 133,662

Int. Cl. B26d *1/46*

U.S. Cl. 83—802 **8 Claims**



A vertically orientated plate-like member pivotally mounted on a meat saw so as to be vertically adjustable within the path of movement of meat being cut and swingable vertically in response to meat passing thereunder. The member is mounted for lateral adjustment toward and away from the blade of the machine and is adapted to ride along the lean line of the meat so as to act as a guide along which the meat can be moved to insure the retaining of a predetermined amount of fat thereon. The plate-like member, positioned laterally of the blade, also effectively acts as a guard against accidental contact with the blade by the meat handler.

3,731,580

TONE BAR FIXING STRUCTURE FOR A METAL TONE BAR TYPE PERCUSSION MUSICAL INSTRUMENT

Shigeo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Nov. 25, 1970, Ser. No. 92,801

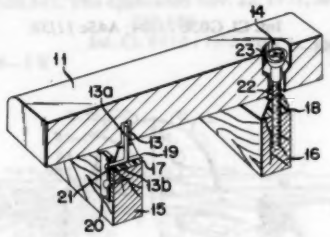
Claims priority, application Japan, Nov. 28, 1969, 44/112653

Int. Cl. G01d *13/08*

U.S. Cl. 84—403 **13 Claims**

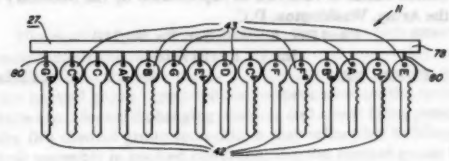
A metal tone bar type percussion musical instrument comprises a plurality of metallic tone bars arranged side by side on

a pair of spaced apart support members. Each tone bar has at one nodal point a generally L-shaped engagement member including a vertical section and a horizontal section extending, respectively, perpendicular and parallel to the tone bar and has a through hole at the other nodal point. The tone bar is



fixed to one of the support members by means of the L-shaped engagement member with the engagement member being mounted to the lower side of the tone bar, and to the other of the support members by driving a screw or nail thereinto through the hole.

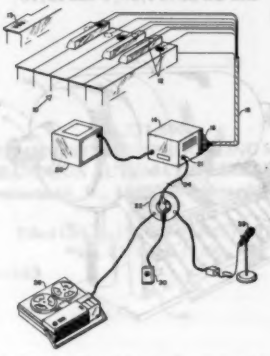
3,731,581
MUSIC TEACHING AID
Lucy E. Griffin, 3661 Charleswood, Memphis, Tenn.
Filed Aug. 10, 1971, Ser. No. 170,469
Int. Cl. G09b *15/02*
U.S. Cl. 84—471 **4 Claims**



A device or aid used for teaching key signatures in music. The device includes a plurality of key-shaped members, one for each key signature having indicia thereon indicating the music key, and the device includes a hanger to removably hang the key-shaped members adjacent one another for selection by the pupil. The key-shaped members representing key signatures composed of sharps are provided with pointed protrusions representing the number of sharps in the key signature, and the key-shaped members representing key signatures composed of flats are provided with squared protrusions representing the number of flats in the key signature.

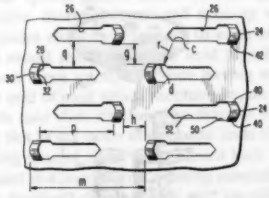
3,731,582
SIGHT AND SOUND TEACHING AID FOR KEYBOARD INSTRUMENTS
Cecil F. Gullickson, 2018 Fosgate Drive, Winter Park, Fla.
Filed July 14, 1970, Ser. No. 54,733
Int. Cl. G09b *15/08*
U.S. Cl. 84—478 **1 Claim**

A sight and sound instructional arrangement for use in conjunction with a keyboard instrument, involving the use of illumination means associated with certain keys of the keyboard instrument, in conjunction with means sensitive to certain frequencies and connected to turn on the illumination means upon these certain frequencies being received by the frequency-sensitive means. This arrangement is particularly suitable for use by a beginning musician inasmuch as by the use of this invention, he or she can see certain keys illuminated at such time as the frequency-sensitive means receives the preascertained frequencies. One preferred embodiment of this inven-



tion involves the use of instructional tapes containing voice instruction for the beginning musician as well as tones or frequencies for causing keys appropriate to the instruction to be illuminated at the proper time.

3,731,583
CONNECTOR PLATE
John Calvin Jureit, Coral Gables, Fla., assignor to Automated Building Components, Inc., Miami, Fla.
Filed July 30, 1971, Ser. No. 167,374
Int. Cl. F16b *15/00*
U.S. Cl. 85—13 **8 Claims**



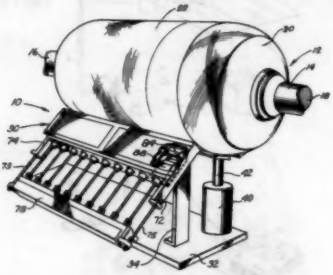
The connector plate has a plurality of nail-like teeth struck to project at right angles to the plate for embedment into adjoining wooden members of the hard wood variety. The teeth are struck in longitudinal rows, the teeth in each row being staggered relative to the teeth of next adjacent rows. The slots in next adjacent rows of teeth extend from the associated teeth in opposite directions. Each tooth has lateral shoulders projecting from the opposite edges of the tooth adjacent its base portion. The slot portions left in the plate by the shoulder portions lie opposite the metal portion of the plate between adjacent slots in next adjacent longitudinal rows thereby preserving net section. Increased back-to-back spacing of the teeth in next adjacent rows is provided to preclude cutting and slicing the wood upon insertion of the teeth into the wooden members of the joint. Also, the tips of the teeth are substantially blunt with the lateral edges defining each tooth tip forming an included angle of about 100 degrees whereby the tendency of the wood to split in particularly hard woods is substantially reduced.

3,731,584

AUTOMATIC PROPELLANT FEED SYSTEM

Bruce Gilbert, Waco, Tex., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed June 13, 1967, Ser. No. 648,528
Int. Cl. B31c *1/00*; F42b *33/10*
U.S. Cl. 86—1 12 Claims



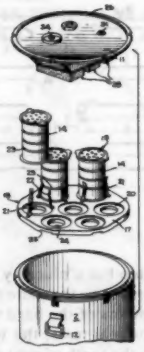
Apparatus and process for making filament reinforced solid propellant grains by automatically extruding uncured propellant and winding filaments onto a rotating grain-forming mandrel. Heatable compactor blades, underlying the mandrel, spread the propellant evenly and lower its viscosity if necessary as the propellant is applied from a plurality of extruders. The compactor blades and extruders are interconnected to simultaneously move toward and away from the mandrel.

3,731,585

CONTAINER FOR EXPLOSIVES

Edmund Demberg, Wharton, and Sylvestro Ruffini, Budd Lake, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 4, 1970, Ser. No. 95,175
Int. Cl. C06b *21/02*
U.S. Cl. 86—1 5 Claims



An improved storage container is disclosed for the safe storage of materials such as sensitive explosives and pyrotechnic mixtures. The container is fluid tight with a removable cover and an internal support means in which the sensitive material is held while immersed in a desensitizing liquid. Gauging means are provided for monitoring the level of the desensitizing liquid and filling and pressure control means are included for maintaining the liquid level and for preventing a pressure build-up within the container as well as for providing for a controlled pressure release during storage or when the container is to be opened.

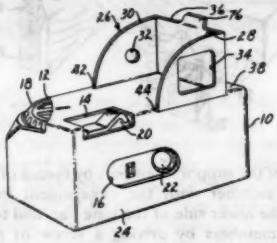
The invention described herein may be manufactured used and licensed by or for the Government for Governmental purposes without the payment to us of any royalties thereon.

3,731,586

CAMERA CASE WITH RETRACTABLE VIEWFINDER

Roberto Meazza, Milan, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 18, 1971, Ser. No. 190,176
Claims priority, application Italy, Oct. 16, 1970, 54097 A/70
Int. Cl. G03b *13/04*; A45c *11/38*
U.S. Cl. 88—1.5 R 3 Claims



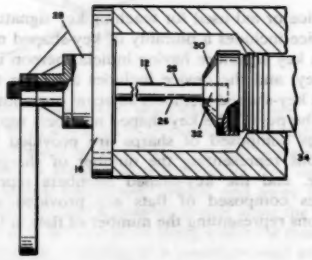
A camera case which includes a retractable view finder having substantially parallel plate members with opposed, viewfinding orifices therein, the plate members being retractable through slots in the case to assume positions between adjacent walls of the camera and the case.

3,731,587

PROJECTILE EXTRACTION APPARATUS

Andrew A. Digiacomo, West Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 8, 1970, Ser. No. 96,210
Int. Cl. F41f *17/16*
U.S. Cl. 89—1 R 2 Claims



An apparatus for the extraction of a jammed artillery projectile from the bore of an artillery piece, comprising in combination, a first cooperative attachment means, said means depending from the breech end of an artillery projectile; a second cooperative attachment means, said second means being complementary and attachable to said first means, said second means disposed at the end of an extension rod; the extraction of the jammed projectile being attained by the insertion of said extension rod into the breech of the artillery piece, followed by the securing of said second means to said first means and the subsequent removal of the jammed shell by the pulling of the extraction apparatus, with attached projectile, out through the breach of the artillery piece.

3,731,588

MACHINE GUN HAVING TRIGGER GROUP

George F. Curtis, East Longmeadow, and Henry J. Tatro, Jr., Westfield, both of Mass., assignors to Colt Industries Operating Corp., Hartford, Conn.

Continuation-in-part of Ser. No. 857,479, Sept. 12, 1969, Pat. No. 3,688,641. This application Nov. 22, 1971, Ser. No. 200,686

Int. Cl. F41d *11/02*

U.S. Cl. 89—1 K 24 Claims

The machine gun of this invention features a bolt assembly reciprocably mounted within a receiver and removably maintained within the receiver by a single latch mechanism, and a fire control group supported for reciprocation on the receiver between a forward charging position and a rear firing position, the fire control group including a sear releasably holding the bolt assembly in cocked condition, the fire control group having a releasable latch and a trigger pivot shaft mounted for movement laterally of the receiver and serving as a safety when the fire control group is in rear firing position.

3,731,589

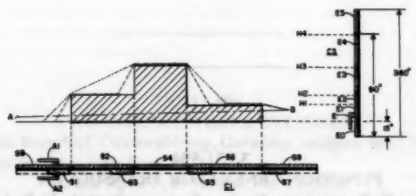
METHOD OF AND APPARATUS FOR ATUOMATICALLY CLEARING A DIRECTIVE GUN FROM OBSTACLE

Rolf D. Pfeiffer, and Wolf D. Gruenberg, both of Doernigheim, Germany, assignors to Honeywell G.m.b.H., Frankfurt am Main, Germany

Filed April 3, 1969, Ser. No. 814,890

Int. Cl. F41g *5/14*

U.S. Cl. 89—41 C 9 Claims



A method of clearing a biaxially directive gun from obstacles lying at a fixed position in relation to the gun position. The method is used in conjunction with guns which are positioned by a gunner operated sight via a selsyn. The normal control signals transmitted from the gunner operated sight to the gun director circuits are interrupted at predetermined azimuth and elevation positions corresponding to an obstacle location, and preset azimuth and elevation signals are interposed to avoid the obstacle. An example of logic circuitry and other apparatus for implementing the method of the invention is disclosed.

3,731,590

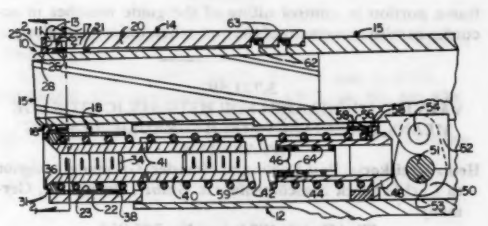
IMPROVEMENTS IN RECIPROCATING SLIDE TYPE HANDGUN AUTOMATIC FIREARMS

John G. Zimmerman, Jr., 19894 Woodward, Mount Clemens, Mich.

Filed Oct. 5, 1970, Ser. No. 78,016

Int. Cl. F41d *11/00*

U.S. Cl. 89—163 13 Claims



A reciprocating slide type handgun automatic firearm is disclosed comprising a slide, a recoil mechanism comprising front and rear spring guides and recoil compression spring means operative therebetween, and take-up means holding said spring guides slidable in respect to each other so that all parts of said recoil mechanism are held together as a subassembly without loose parts, said slide having means for holding the front end of said recoil mechanism, an internal radial slot formed in said slide on opposite sides of the vertical axis thereof, said slot being open at opposite ends thereof, a barrel bushing having spaced apart protuberant lock means thereon disposed in said slot, said barrel bushing rotatable in respect to said slide to facilitate assembly of said recoil mechanism in said firearm, said protuberant lock means holding said barrel bushing axially fast in the front end of said slide, said barrel bushing having means thereon for pushing upon the front end of said recoil mechanism during recoil of said firearm.

3,731,591

GEAR SHAVING MACHINE

Richard W. Tersch, Grosse Pointe Woods, and Arthur B. Bassoff, Oak Park, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

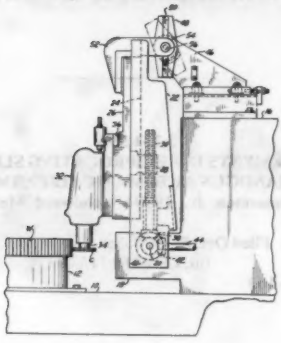
Filed Nov. 29, 1971, Ser. No. 202,886

Int. Cl. B23f *9/04, 5/12*

U.S. Cl. 90—1.6 10 Claims

A machine for shaving the teeth of a relatively large gear and simultaneously imparting a longitudinally crowned formation thereto, comprising a tiltable guide member, a cutter

head slide movable along the tiltable guide member, and cam means interconnecting the cutter head slide and a stationary



frame portion to control tilting of the guide member in accordance with movement of the cutter head slide therealong.

3,731,592

VALVING MECHANISM FOR HYDRAULIC STORAGE MEANS, ESPECIALLY FOR HYDRAULIC TESTING APPARATUS

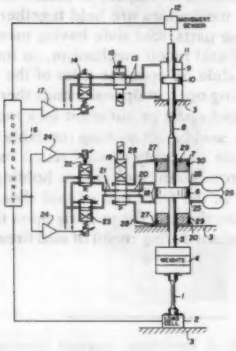
Heinz Kreiskorte, Post Dortmund-Hoerder, Germany, assignor to Carl Schenck Maschinenfabrik GmbH, Darmstadt, Germany

Filed Dec. 8, 1971, Ser. No. 205,957

Claims priority, application Germany, Oct. 28, 1971, P 21 53 749.5

Int. Cl. F15b *11/16, 13/06*

U.S. Cl. 91—411 A **6 Claims**



The present valving mechanism forms part of the load piston cylinder means, for example, of a hydraulic testing apparatus. The load cylinder is provided with a first control inlet at each end thereof and a second control inlet substantially at each end of the resonant stroke of the piston. Storage means are connected to the load cylinder also substantially at each end of said resonant stroke. Further, control ring pistons are slideably arranged on the piston rod on each side of a piston which is fixed to the rod. The control ring pistons close or open the ports to said storage means.

3,731,593

AXIAL PISTON PUMP

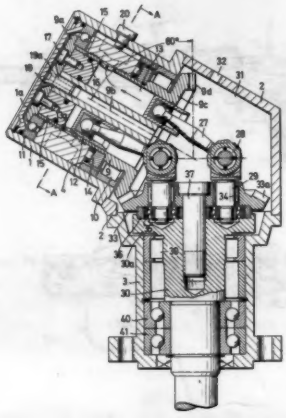
Ilie Chivari, Bochum, Germany, assignor to Uulkan Kupplungs-u. Getriebebau Bernhard Hackforth, Wanne-Eickel, Germany

Filed March 10, 1970, Ser. No. 18,183

Claims priority, application Germany, March 13, 1969, P 19 12 634.2

Int. Cl. F01b *13/04*

U.S. Cl. 91—487 **6 Claims**



A pump comprises a rotary cylinder block which contains a number of axially reciprocating pistons and the axis of rotation of which is inclined to the axis of rotation of a driving shaft of the pump; the cylinder block is driven by the driving shaft through bevel gears having a 1:1 ratio. The cylinder block rotates in bearings in a pump housing and the pistons are connected to a driving flange on the driving shaft by connecting rods which extend between universal joints at their ends. Each cylinder is connected through a port in the cylinder wall to an inlet duct during substantially half of each revolution of the cylinder block and to an outlet duct during substantially the remaining part of each revolution. The inlet and outlet ducts are situated on opposite sides of the plane which contains the axes of rotation of both the cylinder block and the driving shaft. The bearings in which the cylinder block rotates extend around the periphery of the cylinder block and the bevel gears are external, the driving bevel gear extending around the periphery of the driving flange and the driven bevel gear extending around the periphery of the cylinder block. The ports are directed outwards from the cylinders towards inlet and outlet ducts arranged between the cylinder block and the internal peripheral wall of the housing and these ducts connect with further inlet and outlet ducts through the housing itself.

3,731,594

FUNCTION GENERATOR TRANSDUCER

George C. Rannenberg, Canton, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

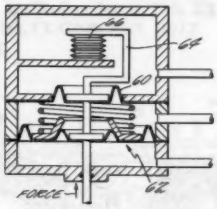
Filed Feb. 25, 1971, Ser. No. 118,718

Int. Cl. G01l *7/08*

U.S. Cl. 92—36 **6 Claims**

A force equal to a function of a sensed pressure is obtained

by combining a stroking and nonstroking piston by use of diaphragms sensing a pressure. One of the pistons carries a



variable area surface which varies the effective area of the diaphragm forming a part of the other piston.

3,731,595

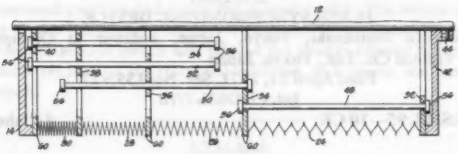
CYLINDRICAL BELLOWS SEAL FOR EXTENSIVE AXIAL MOVEMENT

Robert Seabury Wentworth, Jr., Wilmington, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 1, 1971, Ser. No. 203,620

Int. Cl. F01b *19/00;* **F16j** *3/00*

U.S. Cl. 92—37 **10 Claims**



A composite cylindrical bellows seal including a plurality of cylindrical bellows seal segments each hermetically connected at each axial end to respective annular limit discs. Certain of the limit discs are commonly connected between two adjacent bellows segments to form the composite bellows seal. Limit rods are connected between the limit discs in a manner permitting unrestrained contraction of each bellows segment while limiting the expansion of each bellows segment to within an appropriate limit selected for the respective bellows segment. The limit disc at one end of the composite seal is adapted to be hermetically connected to a movable actuator rod or shaft and the limit disc at the other end of the composite seal is adapted to be connected to the housing or body which receives the actuator rod.

3,731,596

TWO-CIRCUIT WHEEL CYLINDER

Jochen Burgdorf, Odenwaldring, Germany, assignor to ITT Industries, Inc., New York, N.Y.

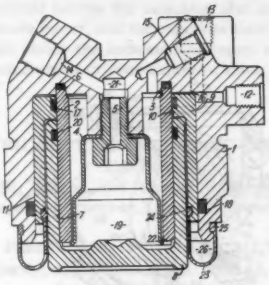
Filed April 5, 1971, Ser. No. 131,195

Claims priority, application Germany, April 30, 1970, P 20 21 208.2

Int. Cl. F01b *1/02*

U.S. Cl. 92—52 **14 Claims**

There is disclosed various embodiments of a two-circuit wheel cylinder including two concentric cylinders and two pistons associated therewith. The cylinders and pistons cooperating to form two pressure chambers. The appropriate



surfaces of the two pistons are separately sealed to cooperating surfaces of the two cylinders so that a leak in either seal arrangement may be readily detected externally.

3,731,597

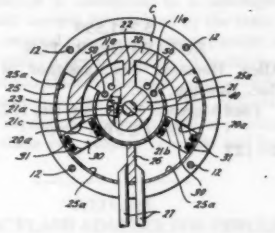
ROTARY OPERATOR

Glen D. Payne, Houston, Tex., assignor to The Arcas Company, Houston, Tex.

Continuation-in-part of Ser. No. 42,240, June 1, 1970, abandoned. This application Feb. 16, 1972, Ser. No. 226,834

Int. Cl. F01c *9/00;* **F16j** *1/10*

U.S. Cl. 92—120 **6 Claims**



A rotary operator for operating a valve or the like by rotating same a partial revolution in either rotational direction, wherein the operator has a pair of self-centering floating pistons movable by an arcuately curved piston rod in a tubular insert assembly mounted in a housing, and wherein each piston has a double O-ring seal which prevents misalignment and resultant binding of pistons during arcuate floating movement controlled by fluid pressure introduced into the insert assembly. The tubular insert assembly is made from conventional tubing which is bent to an arcuate shape so as to eliminate machining and other relatively expensive manufacturing costs.

3,731,598

FLUID PRESSURE OPERATED MOTOR OR GENERATOR

Andre Brignon, Saint Maur, and Michel Georges Durand, Villeparisis, both of France, assignors to Compagnie Des Freins et Signaux Westinghouse, Freinville-Sevran, France

Filed July 7, 1971, Ser. No. 160,452

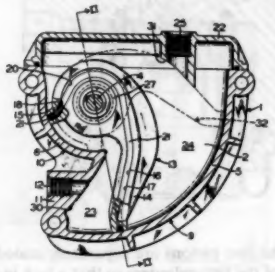
Claims priority, application France, Aug. 13, 1970, 7029786

Int. Cl. F01c *9/00*

U.S. Cl. 92—125 **5 Claims**

A fluid pressure operable rotary motor or generator characterized by a pressure blade fixed to a shaft for effecting limited angular rotation of the shaft about its axis in opposite

directions, the direction of said rotation being determined by the dominant pressure of two opposing pressures acting on respective opposite sides of said blade which is mounted in a single-piece casing section to accommodate said limited angular rotation of the blade, said blade having peripherally disposed sealing means thereon for making sealing contact with the inner surface of said casing section thereby sealingly isolating said opposite sides of the blade.



3,731,599

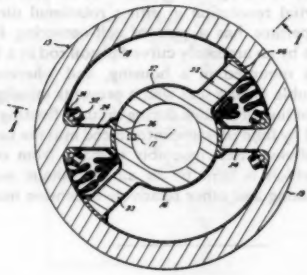
ROTARY OPERATOR

Herbert Allen, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed March 8, 1971, Ser. No. 122,063

Int. Cl. F01c 9/00

U.S. Cl. 92—122 **3 Claims**



There is disclosed an operator in which flexible bags are disposed between adjacent vanes and fixed walls on a rotatable shaft and a housing, respectively, which extend across an annular chamber formed by the shaft and housing and arranged concentrically about the shaft. Pressure fluid is selectively admitted to bags on one side of the vanes while being exhausted from bags on the other sides of the vanes so as to cause the vanes to rotate between alternate positions within the chamber.

3,731,600

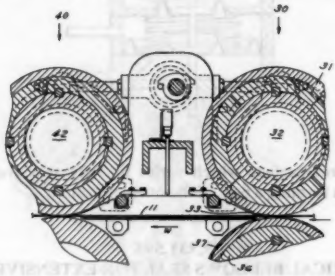
RESILIENT FEMALE SCORING

James F. Earp, Clearwater, Fla., assignor to Ex-Cello-O Corporation, Detroit, Mich.

Filed March 16, 1971, Ser. No. 124,698

Int. Cl. B31b 1/14

U.S. Cl. 93—58.1 **2 Claims**



A paperboard scoring arrangement for a rotary converter unit utilizing a typical male scoring roll in conjunction with resilient blanketed scoring roll of narrow cross-section and mounted on a metal backing cylinder.

3,731,601

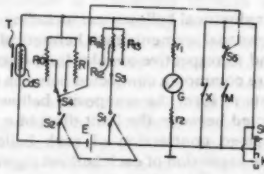
FLASH SYNCHRONIZING DEVICE

Soichiro Matsuzaki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed April 21, 1971, Ser. No. 135,927

Int. Cl. G03b 7/16

U.S. Cl. 95—10 CE **4 Claims**

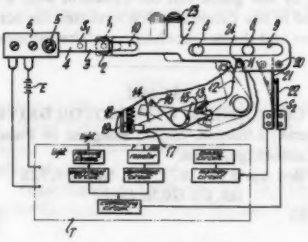


Flash synchronizing device of a photographic camera having an automatic exposure control device and a programming shutter for synchronizing a flash bulb used with the camera so as to obtain the proper exposure. The device comprises M-contacts coupled with the shutter so as to be closed at about the moment the shutter blades begin to be opened, and a variable resistor connected to the automatic exposure control device of the camera and coupled with a distance setting ring of the camera so that the resistance of the variable resistor is varied as the distance set in the distance setting ring is varied. The resistance characteristics of the variable resistor is so determined that the aperture of the programming shutter is increased by the resistance of the variable resistor beyond the aperture normally obtainable by the automatic exposure control device thereby permitting the decrease in the light quantity received through the shutter due to the non-synchronization of the peak of radiation of the flash bulb with the full aperture of the shutter controlled by the automatic exposure control device to be compensated for to attain the proper exposure.

3,731,602
REFLEX CAMERA AUTOMATIC SHUTTER TIMING MECHANISM

Yukio Umemura, Tokyo, Japan, assignor to Asahi Kogaku Kogya Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 26, 1971, Ser. No. 202,360
Claims priority, application Japan, Feb. 22, 1971, 46/10386
Int. Cl. G03b 7/08, 19/12
U.S. Cl. 95—10 CT 4 Claims

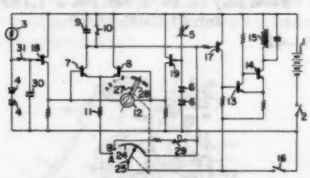


A single lens reflex camera includes a shutter control network connected through a first normally open switch to an energizing battery and containing a light measuring circuit and an adjusting circuit connected to a computor circuit whose output is connected through a normally closed second switch to a memory circuit which controls a shutter timing circuit. The partial depression of the shutter release button closes the first switch and a mirror retraction member, before release of the shutter, actuates a member which locks the button in its depressed position and opens the second switch. The return of the mirror retraction member retracts the locking member to close the second switch and release the shutter release button which returns to its retracted position and opens the first switch.

3,731,603
AUTOMATIC EXPOSURE TIME CONTROL DEVICE FOR CAMERAS

Shigei Ono, Yokohama-shi, and Ichiro Hamaguchi, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 13,078, Feb. 20, 1970, abandoned.
This application June 15, 1971, Ser. No. 156,956
Claims priority, application Japan, Feb. 26, 1969, 44/13980
Int. Cl. G03b 7/08
U.S. Cl. 95—10 CT 4 Claims

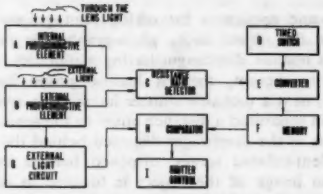


An improved automatic exposure time control device for cameras is composed of mechanical and electronical parts. A means is provided for converting the brightness of the object to be photographed into the control current including a photosensitive element and a capacitor wherein a differential amplifier is integrated, one input of said amplifier is subjected to a voltage proportional to logarithm of the brightness of the object and the other is subjected to a voltage in response to the exposure factors. Further an indicator is connected between said input terminals and another manually adjustable resistor is provided for manual control. The control current which sets exposure time is compensated for automatically by the circuit including the differential amplifier and the indicator with regard to the characteristics of the photosensitive element. When the mechanism is switched to manual control the measuring circuit having the indicator also acts as the interlocked exposure meter, and the exposure time may selectively coincide with either the indicated optimum value or the arbitrary deviated under-or over-exposure value.

3,731,604
ELECTRIC SHUTTER OPERATING CIRCUIT FOR CAMERAS

Masaya Fujii, Tokyo, and Osamu Ichihashi, Hamamatsu, both of Japan, assignors to Yashica Company, Ltd., Tokyo, Japan

Filed June 10, 1971, Ser. No. 151,719
Claims priority, application Japan, June 12, 1970, 45/50521
Int. Cl. G03b 7/08, 9/62
U.S. Cl. 95—10 CT 5 Claims

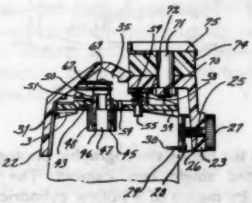


A ratio detector detects the ratio between the resistances of internal and external photoconductive elements. The output of the ratio detector is converted to a corresponding resistance value, and current determined by the ratio is applied during a definite interval to a first charge capacitor, acting as a memory for the ratio. A second capacitor is charged through the external photoconductive element concurrently with the opening of the shutter of the camera. The outputs from the first and second capacitors are compared to produce an output pulse when these two outputs coincide and to close the shutter.

3,731,605
ELECTRONIC FLASH ADAPTER FOR PERCUSSION-IGNITABLE FLASH CAMERAS

Keisuke Kitagawa, Tokyo, Japan, assignor to Kalimar, Inc., St. Louis, Mo.

Filed June 25, 1971, Ser. No. 156,887
Claims priority, application Japan, May 11, 1971, 46/030873; May 11, 1971, 46/036983
Int. Cl. G03b 19/02
U.S. Cl. 95—11 R 9 Claims

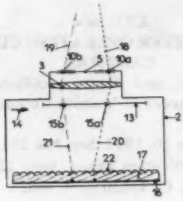


A device for adapting electronic flash units for use with cameras designed for use with percussion-ignitable flash lamps. The adapter includes a body member having a socket connector which engages the camera flash bulb receiving socket. The body also includes a support for engaging the pedestal of an electronic flash unit; within the body, contacts are provided for closing the electronic flash unit circuit upon operation of the camera shutter release.

3,731,606
PROCESS AND APPARATUS FOR THE TAKING OF PHOTOGRAPHS IN RELIEF

Marcel Geoffray, 10 rue Lenotre, Rillieux, France

Filed April 27, 1971, Ser. No. 137,865
Claims priority, application France, April 29, 1970, 7015597
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 P 5 Claims

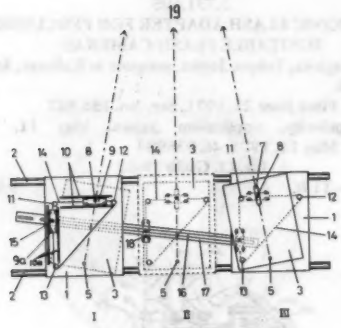


Method and apparatus for taking photographs in relief. Light from the object being photographed is first passed through an opaque diaphragm having a plurality of pairs of spaced slots therein, then a lens disposed behind the diaphragm, next a movable shutter having two spaced apart slots therein separated a distance equal to the separation of a pair of slots in the diaphragm disposed behind the lens, and finally a lenticulated screen disposed behind the shutter whereby an image of the object is focused in relief on a selected segment of a film.

3,731,607
STEREOSCOPIC CAMERA ARRANGEMENT

Klaus Rudolf Mandler, Nestorstrasse 11, Berlin, Germany

Filed Aug. 6, 1971, Ser. No. 169,688
Claims priority, application Germany, Aug. 11, 1970, P 20 40 952.3
Int. Cl. G03b *35/02*
U.S. Cl. 95—18 P 8 Claims

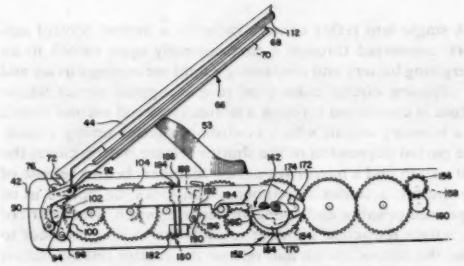


An arrangement for taking stereographic photographs with a movably mounted single lens camera. The camera is pivotally mounted by means of a hollow cylindrical member on a carriage which is laterally movable on a pair of parallel rails with respect to the object to be photographed. The pivot axis of the camera is located in the plane of the lenticular screen, respectively film of the camera. A pair of guide means are slidably mounted in the carriage of the camera and are normally movably mounted with respect to each other on said carriage by being connected to an endless cable which is mounted around at least three rotatable support rollers extending from said carriage. The pair of guide means are connected by means of pin and slot connections to the base of the camera. A guide member having a guide slot which is substantially coextensive with the lateral movement of the camera, is adjustably mounted underneath the carriage and a pin of a first one of said pin and slot connections is slidably movable in the guide slot thereof. A pin of the second one of said pin and slot connections extends into a slot in the base of the camera. A guide rail, being also substantially coextensive with the lateral movement of the camera is mounted underneath the carriage. A vertically movable shaft is coaxially movably mounted in the hollow cylindrical member and its movement is controlled by the guide rail for coaction with a pivotable lever mounted in the camera which actuates the screen moving mechanism and shutter mechanism of the camera.

3,731,608
REFLEX CAMERA WITH MOTOR DRIVE

Edwin K. Shenk, Littleton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed April 16, 1971, Ser. No. 134,725
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 40 Claims

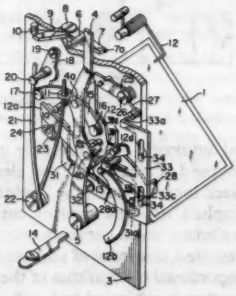


A single lens reflex camera having an electric motor which is energized twice during a photographic cycle. The first energization of the motor occurs for a short interval and functions to release a reflex operator assembly to convert the camera from a viewing to an exposure mode. A subsequent energization of the motor returns the operator assembly to its initial cocked position while simultaneously powering the rolls of a film processing system.

3,731,609
MIRROR MECHANISM FOR A SINGLE-LENS REFLEX CAMERA

Norio Kobayashi, Kawasaki-shi, and Akihiko Sato, Setagoya-ku, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed July 12, 1972, Ser. No. 271,193
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 4 Claims



A mirror mechanism for a single-lens reflex camera whose lens aperture is stopped down with the mirror fixed at its

upper position through manual operation comprises a mirror drive lever 12 and a diaphragm-interlocking lever 28 both rotatably journalled to a mirror box by means of a common shaft. A pressure spring 30 is provided between the two levers to urge them into mutual engagement. A mirror lifting-fixing lever 31 is rotatably journalled to the mirror box for lifting and fixing the mirror. A mirror actuator member 33 for actuating the mirror lifting-fixing lever and the diaphragm-interlocking lever is vertically slidably mounted to the body of the camera. The mirror actuator member is formed with a retainer portion 33*a* for releasing the engagement between the mirror drive lever and the pressure spring when the mirror is lifted and fixed.

3,731,610
ELECTRO-OPTICAL PRINTER WITH VARIABLE SPACING AND WIDTH CONTROL

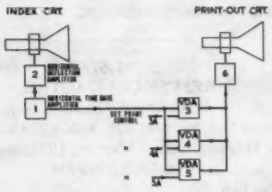
Derek J. Kyte, Chorleywood, England, assignor to Linotype-Paul Limited, London, England

Filed March 5, 1970, Ser. No. 16,913

Claims priority, application Great Britain, March 17, 1969, 13,979/69

Int. Cl. B44b *19/04*

U.S. Cl. 95—4.5 **8 Claims**



An electro-optical system for printing a line of characters from appropriate matrices of the characters comprises a cathode ray tube for successively scanning the matrices, and means for translating the modulated light signals thus obtained into electrical signals which are transmitted to print-out means comprising a cathode ray tube producing a raster comprising successive parallel trace lines and optical means for projecting the trace lines on a film in spaced parallel relationship. The print-out cathode ray tube comprises means for deflecting the light spot in a first direction to form a trace line and means for deflecting it incrementally in a second direction perpendicular to the first between successive trace lines to adjust the spacing between trace lines. It is thereby possible to control the width and spacing between printed characters and to obtain an overlap of characters when desired.

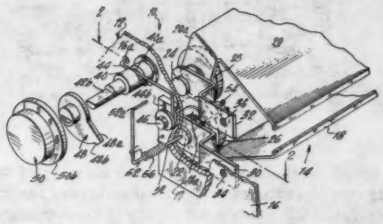
3,731,611
EXPOSURE CONTROL SYSTEM FOR REPRODUCTION DEVICES

Torulf F. Assen; Philip Kiernan, and Bernard Mogil, all of Hollywood, Fla., assignors to Copystatics Manufacturing Corporation, Miami Lakes, Fla.

Filed Feb. 11, 1972, Ser. No. 225,481

U.S. Cl. 95—62 **7 Claims**

An exposure control system is provided for adjusting the opening between a pair of rotatable exposure shutters to control the amount of light to which each section of a copy paper or film is exposed as it passes the shutter opening. The shutter opening is adjusted by selectively rotating the exposure shutters toward or away from each other through actuation of a shutter rod and driving gear which are fixed to one of the exposure shutters. As the driving gear rotates it engages and drives another gear fixed to the other one of the exposure shutters and thereby pivots the exposure shutters toward or away from each other to adjust the shutter opening therebetween. The shutter rod is spring-biased against an actuating cam mounted to rotate with an exposure control shaft



which may be manipulated to a selected dial position in accordance with the desired shutter opening and exposure. A single retaining and friction spring locks the exposure control shaft to prevent it from moving in an axial direction and also provides sufficient friction to maintain the exposure control shaft and actuating cam at the selected dial position and shutter opening.

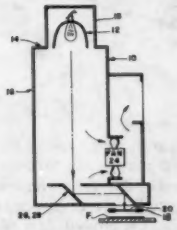
3,731,612
PHOTOGRAPHIC DEVELOPING DEVICE

Frederick W. Schmidt, Bedford Heights, and William P. Hamilton, Cleveland, both of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Sept. 22, 1971, Ser. No. 182,642

Int. Cl. G03d *13/00*

U.S. Cl. 95—89 R **3 Claims**



An apparatus for optical development of images in non-silver organic free radical photosensitive media. The apparatus provides uniform high intensity radiation of desired wavelengths without accompanying heat or infrared (IR) radiation which is detrimental to the apparatus and to the photosensitive medium.

3,731,613
APPARATUS FOR CONTINUOUSLY PRODUCING RAW JUICE BY DIFFUSION, ESPECIALLY FOR THE PRODUCTION OF SUGAR

Reinhard Wolff, and Walter Dietzel, both of 3300 Braunschweig, Germany, assignors to Braunschweigische Maschinenbauanstalt, Braunschweig Am Altem Bahnohof, Germany

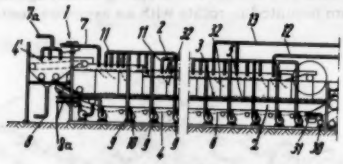
Filed Jan. 19, 1972, Ser. No. 219,067

Int. Cl. B01d *33/24*

U.S. Cl. 99—275 **10 Claims**

A raw juice producing apparatus originally designed for the leaching of sugar cane raw material is adapted for use with

sugar cane raw material and/or with sugar beet raw material. For this purpose a substantially horizontally travelling conveyor, the upper run of which travels over a sieve or screen bottom in a trough, is provided with an endless cover made of a fabric or netting that is permeable to liquid. Preferably, the



total length of the cover comprises a plurality of fabric or netting sections secured to carrier members of the travelling conveyor. Cleaning means are arranged for cooperation with the lower run of the conveyor for maintaining the liquid permeability of the fabric or netting.

3,731,614

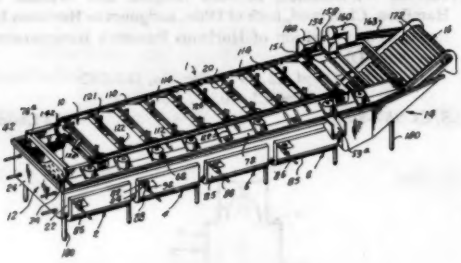
APPARATUS FOR COOKING FOOD PRODUCTS

Donald Paul Smith, 4530 Woodfin Drive, and Raymond E. Booth, P.O. Box 34568, both of Dallas, Tex.

Filed Dec. 17, 1971, Ser. No. 209,132

Int. Cl. A47j *37/12*

U.S. Cl. 99—404 **8 Claims**



A method and apparatus for cooking food products wherein a plurality of spaced pumps are arranged to circulate fluid over heating elements of different temperatures spaced in successive planes longitudinally of a cooking trough through which the food product is moved. Jets of heated fluid are introduced into the cooking trough to impinge surfaces of the product, the heated fluid being removed from the cooking trough at spaced locations intermediate ends thereof and circulated across the heating elements for introduction back into the trough such that distinct heating zones of different temperature are formed longitudinally of the trough through which the product is moved at a continuous controlled rate. Floating fat and debris pass into an overflow trough extending longitudinally of the cooking trough for delivery to a drain opening.

3,731,615

CHERRY PITTER

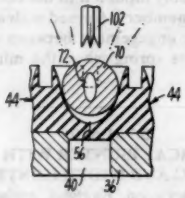
John L. Margaroli, Oakland, and Fred J. Cimperman, San Lorenzo, both of Calif., assignors to Vistan Corporation, San Leandro, Calif.

Filed Oct. 5, 1970, Ser. No. 77,961

Int. Cl. A23n *3/00*

U.S. Cl. 99—559 **13 Claims**

Apparatus and method for removing pits from fruit such as cherries or the like wherein a moveable conveyor is adapted to convey the fruit to pitting knife means. The conveyor has a plurality of open-topped fruit pockets formed therein, each of said fruit pockets being adapted to have disposed therein individual specimens of said fruit. Normally closed slits are provided in the bottoms of said pockets for retaining water therein so that said fruit may orient itself under the influence of gravity while floating. A plurality of slots are formed in the conveyor with at least one of the slots in communication with



the interior of each of the fruit pockets. Stem positioning means is disposed adjacent to the path of movement of the conveyor for engaging the stems of the fruit disposed in the fruit pockets as the fruit is being conveyed to the pitting knife means. The stem positioning means positions each fruit stem in a slot which is in communication with the interior of the pocket within which the fruit specimen is disposed. During the actual pitting of the fruit the knife means passes through the fruit forcing the pits thereof through the slits.

3,731,616

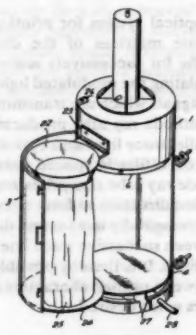
REFUSE COMPACTOR

David R. Ligh, 193 Main Street, Madison, N.J.

Division of Ser. No. 800,220, Feb. 18, 1969, Pat. No. 3,602,136. This application May 19, 1971, Ser. No. 144,892

Int. Cl. B30b *9/04*

U.S. Cl. 100—126 **6 Claims**



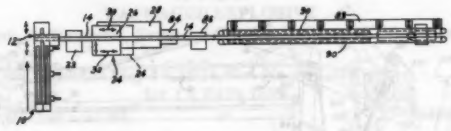
A refuse compactor has an upright housing whose internal compacting chamber is accessible by a door provided in its circumferential wall. The door has a refuse-supporting platform extending from its lower edge and the platform is supported on the lower endwall of the housing when the door is closed. A compacting head fills the cross section of the chamber and is guidedly slidable in axial direction thereof. A power source and motion-transmitting arrangement are provided for advancing the compacting head towards an end wall of the housing to thereby compact refuse between the end wall and the compacting head, and for subsequently withdrawing the compacting head in direction away from the one end wall for enabling removal of the compacted refuse. Drain means drains off any liquid which may be expressed from the refuse.

3,731,617

BOOK NIPPING APPARATUS

Lewis William Hall, Lancaster, Pa., assignor to The Maple Press Company, York, Pa.

Filed Aug. 2, 1971, Ser. No. 168,057
Int. Cl. B30b *15/30*
U.S. Cl. 100—215 14 Claims



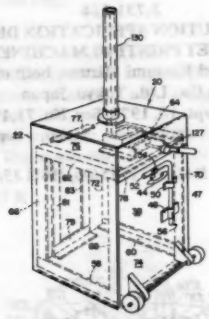
Apparatus and a process used in book manufacture to nip or clamp a group of folded and sewn signatures which are assembled in preliminary manner, side by side, with the folded edges in a common plane to form the spine of the book, the nipping being accomplished by a two-stage jaw mechanism which initially clamps the signatures above the folds with firm pressure adequate to prevent slippage between adjacent signatures so as to prevent what is known as camel-backing in the completed book, while tightly compressing the folded ends of the signatures between jaws spaced a slightly greater distance apart to accommodate the slightly greater thickness of the assembled folded edges to effect a final folded set in said signatures.

3,731,618

REFUSE COMPACTING APPLIANCE

Arthur L. Leman, 28 Rudon Circle, N. Attleboro, Mass.

Filed Nov. 17, 1971, Ser. No. 199,639
Int. Cl. B30b *1/22*
U.S. Cl. 100—229 A 7 Claims



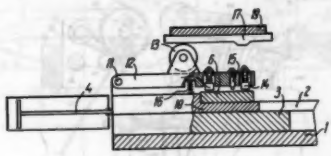
A refuse compacting appliance comprises a housing having top and bottom portions that are secured to each other by reinforcing metal ties, a forward open panel through which a refuse receptacle can be stored in the housing when at least partly empty and withdrawn from the housing when full, and a pressure applying mechanism, which incorporates a pressure plate in registration with the receptacle, a rotatable hand crank in association with a double ratchet mechanism that facilitates operation of the pressure plate, and a worm and gear reduction transmission for providing the necessary mechanical advantage for the exertion of a large force on the pressure plate. The arrangement is such that extremely high compacting pressures can be generated manually, trouble free operation can be prolonged despite such high pressures, and compacted refuse can be removed from the receptacle readily.

3,731,619

DEVICE FOR MARKING FLAT SURFACES OF ARTICLES

Efim Lvovich Petrikovsky, Prospekt imeni Lenina, 45, kv. 34, Chelyabinsk, U.S.S.R.

Filed Dec. 23, 1971, Ser. No. 211,392
Int. Cl. B41f *17/36*
U.S. Cl. 101—4 1 Claim



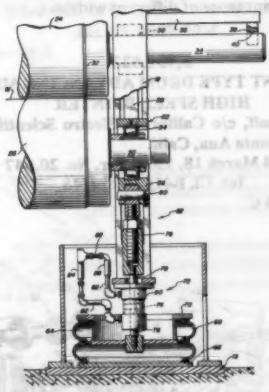
A marking tool is secured on a longitudinally swivelling lever which is connected with a reciprocating slide. In the slide, on its side facing the lever a longitudinal slot is made to locate therein the article to be marked. Mounted on said lever is a roller which interacts with a templet bar immovably fixed on the housing of the device to cause marking of an article.

3,731,620

HYDRAULIC MEANS FOR ADJUSTING EMBOSSING CYLINDERS IN A ROTARY EMBOSSER

Paul J. Klemmer, Lakeland, Fla., assignor to Appleton Machine Company, Appleton, Wis.

Filed Feb. 8, 1971, Ser. No. 113,371
Int. Cl. B44b *5/00*; B30b *3/04*
U.S. Cl. 101—23 3 Claims

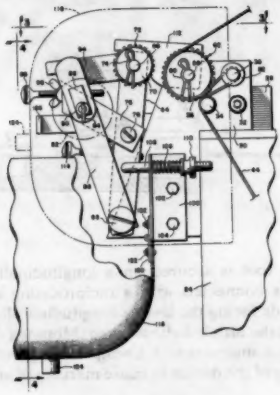


A roll-type embossing machine in which a pair of material processing rolls are supported on a machine frame. One of the rolls is movable relative to the other and relative to the machine frame by a hydraulic-pneumatic power lift device connected to opposite ends of the movable roll supporting shaft. The other roll is fixed in relation to the machine frame and is provided with an engraved material processing sleeve which can be readily removed and replaced on the machine by means of a swingable bearing support means connected to the roll shaft at one end of the roll and a support bracket or fixture attached to the machine frame adjacent the opposite end of the fixed roll and positioned in close proximity to the roll shaft.

3,731,621
TAPE PRINTER APPARATUS

Edmund N. Neckel, Cincinnati, Ohio, assignor to Natmar, Inc., Cincinnati, Ohio

Filed Oct. 14, 1970, Ser. No. 80,668
Int. Cl. B41l 47/46; B41f 1/40
U.S. Cl. 101—92 20 Claims

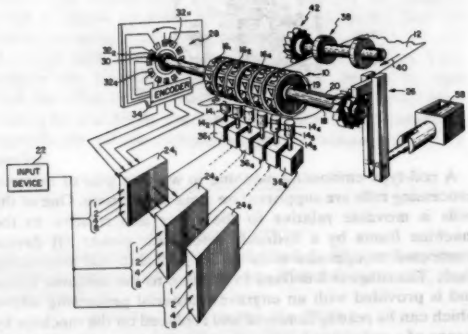


A tape printing apparatus for sequentially printing tapes is disclosed. The tape printer apparatus provides for the premarking of a standard tape before the addition of the usual identification coding is applied. A print roll and ink means are pivotally interconnected by adjoining levers and the print roll is pivotally connected to be engagable with a backup roll over which the tape passes. Each element is respectively disengageable from the next element. The tape printer apparatus may use cartridges of different colors which make the apparatus adaptable to a wide variety of identification systems. Adjustment means are provided to allow the tape printer apparatus to accept and print tapes of different widths.

3,731,622
INTERMITTENT TYPE DRUM ADVANCING MEANS IN A HIGH SPEED PRINTER

Albert J. Baranoff, c/o California Electro Scientific, 2203 S. Grand Ave., Santa Ana, Calif.

Filed March 18, 1970, Ser. No. 20,647
Int. Cl. B41j 7/48, 1/48
U.S. Cl. 101—93 C 18 Claims

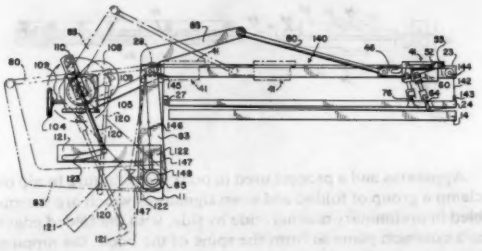


A line printer comprising a set of type wheels that intermittently rotate in unison on a common shaft.

3,731,623
GLIDER PRESS

Henry J. Bubley, Deerfield, and Claude H. Oltra, Chicago, both of Ill., assignors to American Screen Process Equipment Company, Chicago, Ill.

Filed Oct. 26, 1970, Ser. No. 83,800
Int. Cl. B41f 15/00
U.S. Cl. 101—114 20 Claims

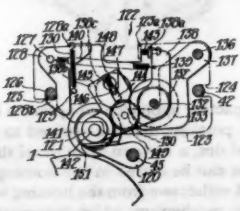


A stencil screen printing press is illustrated having a peeling means which elevates the screen from the surface being printed immediately behind the squeegee for "off-contact" printing. The peeling means elevates the screen faster when the squeegee is at the center of the screen than when the squeegee is at either end to compensate for stretching of the fabric. A novel registration means operating in conjunction with the peeling means is also illustrated. A simplified mechanical drive arrangement permits the press to be of universal design, allowing it to be scaled up or down in width and length to any desired size. A novel carriage assembly to support the squeegee and flood bar is also shown, having a captivated cam arrangement which shifts the squeegee and flood bar at the end of the stroke. Quick change from flood to non-flood condition is also provided.

3,731,624
ETCHING SOLUTION APPLICATION DEVICE FOR OFFSET PRINTING MACHINES

Tamaki Kaneko, and Katsumi Mizuno, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 10, 1970, Ser. No. 71,172
Claims priority, application Japan, Sept. 15, 1969, 44/73074
Int. Cl. B41f 7/32, 35/06; B41l 25/16
U.S. Cl. 101—142 8 Claims



An etching solution application device comprising an etching solution application roller for applying an ink-repellent etching solution to a master plate mounted on a master cylinder of an offset printing machine which device operates such that an etching solution can be supplied to the etching solution application roller before it presses against a master plate on a master cylinder. The device also operates such that the etching solution application roller is rendered inoperative

during steps other than the etching step in which the etching solution application roller presses against the master plate on the master cylinder to apply the etching solution to the master plate and the master plate discharge step in which the master plate on the master cylinder is removed and discharged from the master cylinder, or during the inking step and duplication step.

3,731,625

PACKAGED EXPLOSIVE

Frank E. Slawinski, Tamaqua, Pa., assignor to ICI America Inc.

Filed May 14, 1971, Ser. No. 143,328
Int. Cl. F42b *3/00*
U.S. Cl. 102—24 R **15 Claims**

A skin-tight explosive not having an air space or sag, and a method of making it. An explosive containing a plasticizer-extractor is placed in a flexible polyvinyl chloride bag which has been plasticized with an extractable plasticizer. The air space or sagging bag which would normally form is eliminated due to the shrinkage of the bag.

3,731,626

NON-STRETCHING EXPLOSIVE CORD

Bobby W. Grayson, Oildale, Calif., assignor to Sellers and Brace, Pasadena, Calif.

Continuation-in-part of Ser. No. 27,214, April 10, 1970, Pat. No. 3,572,245. This application Nov. 9, 1970, Ser. No. 87,727
Int. Cl. C06c *5/00*
U.S. Cl. 102—27 R **9 Claims**

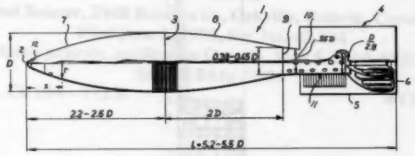
An explosive cord embodying high strength non-stretching means extending therealong and effective to prevent longitudinal stretching of the cord and thereby preventing malfunctioning and propagation failure due to interference with the continuity of the explosive charge. The stretch control filaments may be incorporated in the protective shroud for the cord or applied to the cord independently of the shroud. Additionally the invention cord may include a heat shield exteriorly of the enclosing tube for the explosive material and effective to retard the passage of heat through the latter under higher temperature ambient conditions as in deep earth bores.

3,731,627

GRENADE PROJECTILE

Frederic Arno Donner, Helsinki, and Tapio Kullervo Kronholm, Tampere, both of Finland, assignors to Etablissement Salgad, Vaduz, Liechtenstein

Filed Dec. 21, 1970, Ser. No. 99,772
Int. Cl. F42b *13/22*
U.S. Cl. 102—49.2 **5 Claims**



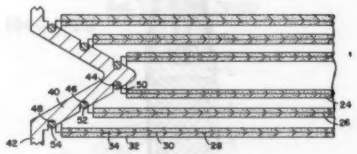
A projectile for grenade launchers and mortars in which the projectile includes a body portion and a tail or stabilizing portion. The maximum diameter of the projectile is at the band portion of the body and is represented by D. Improved range and accuracy are obtained by shaping the body to conform with a Karmann profile, locating the band so it is 2.2D–2.6D from the nose of the body, using a projectile of an overall length L in a range of from 5.2–5.5D, and terminating the inwardly tapering Karmann profile at the rear of the body at an ogival form with a diameter of approximately 0.35D which merges with a straight trailing portion. The usual sleeve and stabilizing fin arrangement is provided at the rear of the projectile.

3,731,628

GRAIN SUPPORT FOR SOLID PROPELLANT ROCKET MOTOR

Robert H. Fink, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 1, 1971, Ser. No. 185,494
Int. Cl. F02k *9/04*
U.S. Cl. 102—49.3 **2 Claims**



A solid propellant rocket motor having a plurality of propellant sheets supported in a manner that the sheets can be burned from both sides without blowing the propellant sheets out of the nozzle at the rear of the rocket motor.

3,731,629

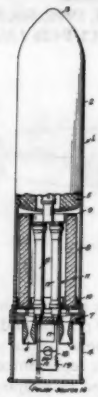
TEMPERATURE DISCRIMINATING DUAL IGNITER ROCKET IGNITION SYSTEM

Charles A. Lombardi, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 27, 1971, Ser. No. 110,286
Int. Cl. F42c *19/12*
U.S. Cl. 102—49.7 **2 Claims**

An igniter system for solid propellant type rockets and is designed to ignite the propellant over a wide range of tem-

perature conditions. The system consists of a pair of igniters in circuitry with a power source. A thermostatic switch in the firing circuit acts upon a low temperature condition to permit firing of both igniters and upon high temperature, only one igniter.



3,731,630

HIGH-EXPLOSIVE ARMOR-PIERCING SHELL

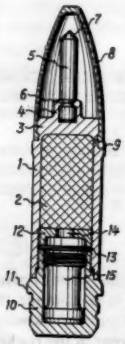
Kurt Muller, 8157 Dielsdorf, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurick, Switzerland

Filed July 29, 1970, Ser. No. 59,136

Claims priority, application Switzerland, Aug. 5, 1969, 11861/69

Int. Cl. F42b *13/06*

U.S. Cl. 102—52 **6 Claims**



A high explosive armor piercing shell having a shell body containing an explosive charge. A sabot is formed at the front end of the body and a hard core projects from the front end of the body with which the sabot cooperates. The hard core is in the shape of a bolt having an end portion secured to the sabot. The front end of the body is in the form of a plate integral with the shell body. The hard core is located in a ballistic cap secured to the front end of the body. The hard core has a peripheral groove cut into its rear portion, and the front end of the body has a beaded edge which engages the groove.

3,731,631

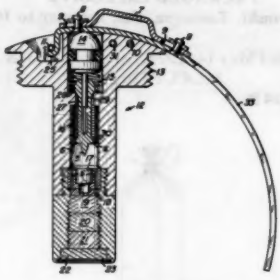
NON PROTUBERANCE MUNITION

Aaron S. Berlin, Wilmington, Del.; Vincent C. Little, Fallston, and Toney E. Leadore, Havre De Grace, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed March 3, 1971, Ser. No. 120,391

Int. Cl. F42b *27/00*

U.S. Cl. 102—64 **5 Claims**



A munition and munition for delivery of a payload to a target site wherein the munition has no protuberance to affect the flight of the munition in transit to the target site or true roll of the munition at the target site.

3,731,632

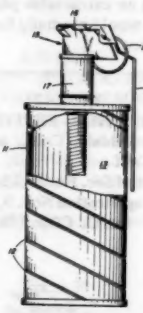
INCENDIARY GRENADE

John H. Stevens, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 30, 1970, Ser. No. 64,917

Int. Cl. F42b *27/04*

U.S. Cl. 102—65 **5 Claims**



An incendiary grenade having a canister provided with scored sides, a burster-igniter assembly positioned at the center of the canister and a gelled fuel substantially filling the canister. The burster-igniter assembly comprises a fuse fitted into a burster well or cylinder which is scored to provide a good ignition burst. The grenade expels material which is hot enough to dry and set fire to rain soaked thatched roofs, etc.

3,731,633

AIR-TO-SURFACE MISSILE

Dale M. Davis, Freeport, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 5, 1966, Ser. No. 584,943

Int. Cl. F42b *13/48*

U.S. Cl. 102—67 **6 Claims**

An improved missile, which when in stabilized flight is constituted of upper and lower longitudinal casing portions, a

warhead including explosive material confined to the lower casing portion and forming part of the last-mentioned casing portion, the outer surface of the warhead being fragmentized and at its front end, takes the shape broadly of a semicylinder which tapers down in depth (as measured from the horizontal axis of the semicylinder) along the length of the warhead to a

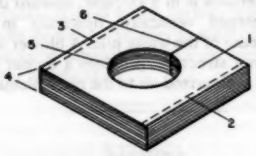
curved shape at the rear end but having less depth than at the front end. The same thickness of explosive material is contained in the warhead throughout its length. Thus, the outer surface of the warhead projects upwardly toward said horizontal axis as its rear end is approached to cause the exploded fragments to leave in a direction rearwardly of the warhead in order to increase the lethal effect of the missile.

3,731,634

WATERPROOFING MORTAR AMMUNITION

Sydney Axelrod, New York, N.Y., assignors to The United States of America as represented by the Secretary of the Army

Filed Sept. 17, 1971, Ser. No. 181,508
Int. Cl. F42b *1/00, 13/22*
U.S. Cl. 102—103 **4 Claims**



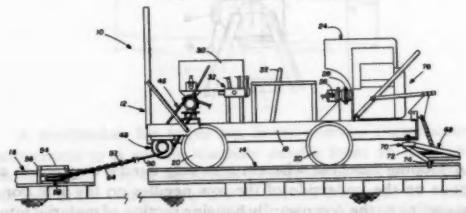
Mortar ammunition comprising a bundle of superimposed sheets of gun-cotton is waterproofed by coating the edges of the bundle with a coating composition of nitrocellulose containing between 10.9 and 11.2 percent by weight nitrogen dissolved in a solvent which does not dissolve guncotton. On removal of the solvent a tough, tight-fitting film of said nitrocellulose is formed, which completely seals the edges of the bundle against water penetration between the sheets and is completely combustible, leaving no residue when the ammunition is fired. The coating composition has no adverse effect on ballistic properties.

3,731,635

RAIL PULLING APPARATUS

Lester N. Hambrick, Irving, Tex., assignor to Trakwork Equipment Company, Irving, Tex.

Filed Aug. 9, 1971, Ser. No. 169,985
Int. Cl. E01b *31/02*
U.S. Cl. 104—1 R **17 Claims**



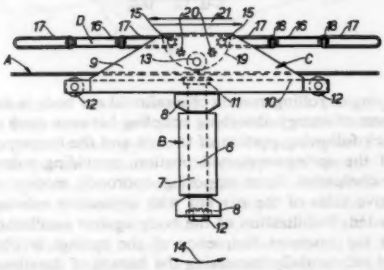
In a rail pulling apparatus, a vehicle is equipped for self-propelled movement along a trackway. The vehicle supports a hydraulic winch, and a cable extends from the winch to a rail clamp adapted to grip a severed rail in the trackway. The vehicle also supports an A-shaped anchoring member which extends from a point on the vehicle aligned with the severed rail into engagement with spaced points on a rail on the opposite side of the trackway.

3,731,636

CONVEYOR

Alfred Reimer, 2048 Rebecca St., Oakville, Ontario, Canada

Filed June 1, 1970, Ser. No. 42,034
Claims priority, application Canada, June 5, 1969, 053563
Int. Cl. B65g *39/20*
U.S. Cl. 104—172 B **4 Claims**



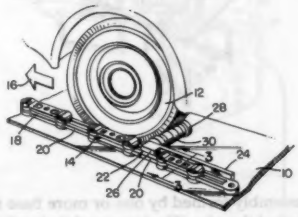
A device for moving a wheeled vehicle along a predetermined path having a track alongside the path with pusher means operating slidably along the track and arranged to push against the wheel of a vehicle in the path to move the vehicle along the path and mechanism to move the pusher means slidably along the track.

3,731,637

PUSHER DEVICE

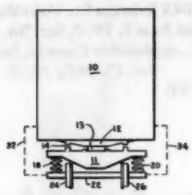
Niels S. Hansen, Fort Wayne, Ind., assignor to Foundation and Bridge Corp., Fort Wayne, Ind.

Filed June 3, 1971, Ser. No. 149,463
Int. Cl. B65g *19/00*
U.S. Cl. 104—172 B **1 Claim**



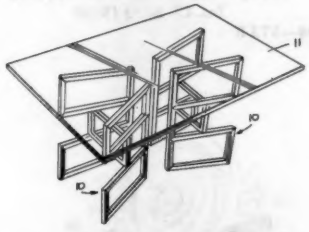
The specification discloses a pusher device for use with the conveyor chain of a car washing installation, or the like, in which the pusher device includes a bracket adapted for manual engagement with and disengagement from the chain and having support rollers rolling on the vehicle wheel support surface and pusher rollers rollingly engageable with a wheel of a vehicle passing through the installation.

3,731,638
RESILIENTLY FRICTIONALLY SWAY STABILIZED RAILWAY CAR
Carl E. Tack, 157 Linden St., Elmhurst, Ill.
Filed Jan. 28, 1970, Ser. No. 6,473
Int. Cl. B61f 5/14, 5/24; F16c 17/04
U.S. Cl. 105—199 A 13 Claims



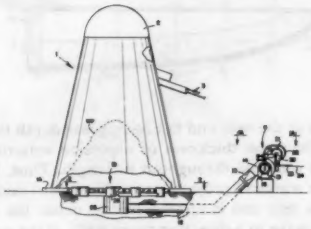
Swaying or rolling motion of a railroad car body is damped by a form of energy-absorbing coupling between each side of the track-following portion of the car and the corresponding side of the spring-supported portion, providing substantial energy-dissipative force opposing approach motion at the respective sides of the car but with separation substantially unimpeded. Stabilization of the body against oscillatory motion at the resonant frequency of the springs is obtained without substantially increasing the hazard of derailment on curves in any range of speeds. A simple form of construction of an energy-absorber for installation on existing conventional cars is described.

3,731,639
TABLE ASSEMBLY
Louis F. Schliemann, and Jerome E. Borgos, both of 418 W. 25th St., New York, N.Y.
Filed April 23, 1971, Ser. No. 136,738
Int. Cl. A47b 3/06
U.S. Cl. 108—157 6 Claims



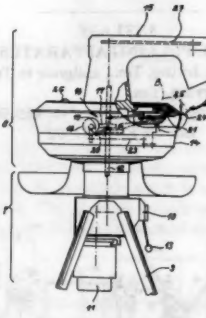
A table assembly formed by one or more base modules and a slab supported thereby. The base module is adjustable to assume a variety of lattice-like or fretted patterns. The modules are constituted by a pair of leg elements, each formed by a post having a foot frame and head frame extending laterally from the lower and upper sections of the post to define an intermediate region occupied by a body frame whose corners are pivotally connected to the midpoints of the foot and head frames, whereby each leg element is rotatable about its midpoint axis and may therefore assume different angular configurations in which the foot frames rest on the floor and the head frames support the slab.

3,731,640
VENTILATION DUCT STRUCTURE FOR A WOOD WASTE BURNER
John D. Stutz, 96 E. Hatton Ave., Eugene, Oreg.
Filed March 20, 1972, Ser. No. 236,036
Int. Cl. F23g 7/00
U.S. Cl. 110—18 R 6 Claims



A duct structure centrally disposed below a wood waste burner providing combustion supporting air to the interior of a waste pile formed within the burner interior. A central main plenum and a supply conduit therefor are in tangential communication to provide a circular, upward flow of air through intake and exhaust zones of the plenum. Secondary plenums are located outwardly from the main plenum at the ends of lateral conduits which are in upstream communication with the exhaust zone of the main plenum. Air flow within each of the secondary plenums is in a circular, upward direction and ultimately discharged vertically, upwardly in a forceful manner into the base of the waste pile. A blower assembly, exterior of the burner structure, provides a burner temperature regulated flow of pressurized air to the main plenum.

3,731,641
LOOPER
Erhard Muller, Kempten, and Harry Wittki, Buchenberg, both of Germany, assignors to X. Fendt and Co. Maschinen-und Schlepperfabrik Postfach, Marktoberdorf, Germany
Filed Nov. 19, 1970, Ser. No. 91,106
Claims priority, application Germany, Nov. 19, 1969, P 19 58 049.5
Int. Cl. D05b 7/00
U.S. Cl. 112—25 10 Claims



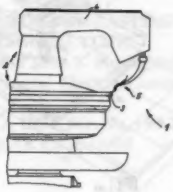
A looping machine wherein a sewing needle engages in a groove on the underside of the row needles on the side corresponding to the downwardly hanging section of material into the looping material for the purpose of stitch formation. The entire drive for the sewing needle is disposed below the crown of the row needles.

3,731,642

LOOPING MACHINE WITH SPRING BEARD NEEDLE

Harry Wittki, 8961 Buchenberg, and Ludwig Weinmuller, 8961 St. Mang, both of Germany, assignors to Kemptener Maschinenfabrik GmbH, Kempten/Allgau, Germany

Filed Dec. 24, 1970, Ser. No. 101,250
Int. Cl. D05b 7/00
U.S. Cl. 112—25 16 Claims



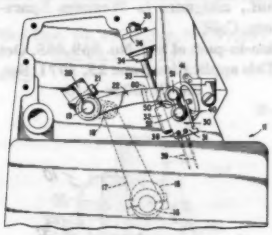
A looping machine with a continuously advancing needle row bed of individual row needles with grooves extending in the longitudinal direction. The looping material to be joined is transferred onto these row needles stitch-by-stitch and row-by-row, and the looping seam is formed by a spring beard needle having a central, downwardly pointing tip in cooperation with a thread feeder. The spring beard needle has a hook with boundary surfaces inclined to the vertical line of symmetry of each row needle as well as parallel to each other. The base of the hook is disposed substantially at right angles to the axis of symmetry of the needle shaft.

3,731,643

NEEDLE RECIPROCATING MECHANISM FOR SEWING MACHINES

Herbert Middlebrook, Appleton, England, assignor to The Singer Company, New York, N.Y.

Filed Dec. 6, 1971, Ser. No. 204,879
Claims priority, application Great Britain, Aug. 6, 1971, 36,978/71
Int. Cl. D05b 55/14
U.S. Cl. 112—221 2 Claims



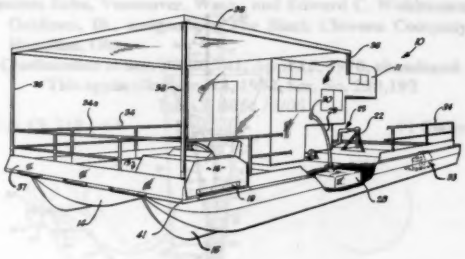
A mechanism for imparting linear endwise reciprocatory movement to a sewing machine needle from an oscillating drive arm by way of a pivotally connected drive link arranged so that at the extreme top and bottom of the stroke of oscillation of the drive arm, the axes of each of the pivotal connections of the drive link intersects the line parallel to the path of linear movement of the needle and passing through the center of mass of the needle carrier.

3,731,644

CATAMARAN VESSEL AND SYSTEM FOR LOADING AND UTILIZING A CAMPER OR TRAILER THEREON

Robert D. Bradt, 7274 Canyon Crest, Whittier, Calif.

Filed May 12, 1971, Ser. No. 142,669
Int. Cl. B63b 1/00
U.S. Cl. 114—61 9 Claims



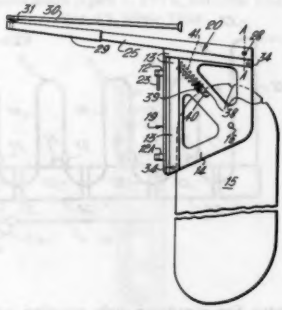
A catamaran vessel adapted to receive a pickup truck camper body or a house trailer is provided with a detachable bow ramp and a stern pylon. A winch supporting dolly is connected to the socket hitch of the trailer or a wheeled frame supporting a camper. The winch cable is attached to the pylon and the winch used to pull the camper or trailer up the detachable bow ramp onto the deck. The forward control podium of the vessel swings out of the way during such loading. The socket hitch then is connected directly to the pylon to maintain the camper or trailer in place, and utility modules on the vessel are connected to the camper or trailer to allow it to be utilized while on board. These modules include, within one catamaran hull, a waste water holding tank which also serves as ballast if the camper or trailer is located off-center of the vessel. The fiberglass hulls of the vessel include outwardly flanged upper edges to which are bolted deck panels comprising a polyurethane core sandwiched between fiberglass or laminated wood sheets.

3,731,645

SAILING CRAFT RUDDERS

Terry Kenneth Pearce, 25 Hall Park Avenue, Westcliff-on-Sea, England

Filed Aug. 13, 1971, Ser. No. 171,695
Int. Cl. B63h 25/06
U.S. Cl. 114—162 7 Claims



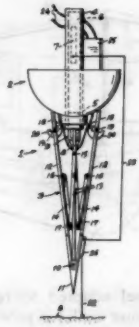
The disclosure is of a sailing craft rudder of the kind comprising a rudder stock to which are fitted a tiller and a rudder blade, the rudder stock comprising a forepart formed of a length of extruded bar with a guideway receiving substantially T-shaped attachment portions of gudgeon brackets, and preferably this length of bar also has flanges and channels for the attachment of cheek plates and a cap or tiller.

3,731,646

EXPLOSIVE EMBEDMENT ANCHOR PROJECTILE

Henry C. Mayo, Fairfax County, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed Aug. 6, 1970, Ser. No. 61,567
Int. Cl. B63b 21/28
U.S. Cl. 114—206 A 5 Claims



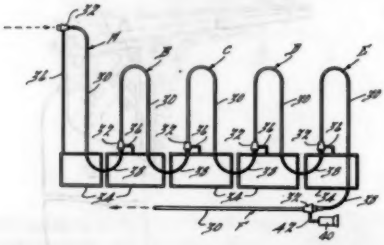
An explosive embedment anchor for use in all types of ocean bottom sediments except consolidated rock. The anchor forms the projectile which is fitted to the gun barrel. The assembly is lowered to the ocean floor and a charge in the gun is detonated by contact therewith to drive the anchor into the sediment. The anchor is provided with a pair of hinged flukes having keying flaps on their upper edges and riser cables. Holding power is achieved by an upward pull on the riser cables causing the keying flaps to wedge against the wall of the crater formed by the anchor's entry and the flukes open to provide maximum pullout resistance.

3,731,647

APPARATUS FOR PROCESSING CONTAINERS

Louis J. Mimbiole, Jr., Detroit; Chester G. Clark, Grosse Pointe Woods, and John W. Neumann, Birmingham, all of Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Division of Ser. No. 774,761, Nov. 12, 1968, Pat. No. 3,620,813. This application April 5, 1971, Ser. No. 130,977
Int. Cl. B05c 11/10, 11/12
U.S. Cl. 118—5 25 Claims



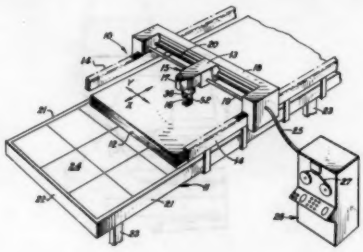
An apparatus for simultaneously treating and conveying container-like workpieces in which the workpieces are introduced and entrained in aligned orientation in a confined stream of a selected treating fluid and are subsequently extracted therefrom and whereafter, if desired, the workpieces are successively introduced into separate succeeding confined streams of alternative selected treating fluids to effect a multiple stage treatment thereof.

3,731,648

DEVICE FOR APPLYING SUBSTANCE TO A SHEET OF MATERIAL

Heinz Joseph Gerber, and David Raymond Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed Jan. 15, 1971, Ser. No. 106,685
Int. Cl. B05c 11/00
U.S. Cl. 118—6 6 Claims



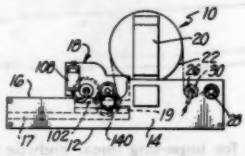
A hollow needle member is used to apply a substance to a sheet of material for marking same or for applying a fluid material along a cut edge of the sheet material. The hollow needle member is mounted for reciprocation along its axis thereof. A controller receives coded input information and converts the input information into two-dimensional directional command pulses and a needle action command pulse. The needle member is moved in response to the two-dimensional directional command pulses over a sheet of material to which the substance is to be applied so that the needle member is disposed in a preselected location over the sheet of material. The needle member is reciprocated in response to the needle action command pulse so that the needle member is contiguous to the sheet of material. Marking material or fluid material which prevents edge fray or bonds edges of several sheets of material is ejected through the hollow needle member to the sheet material. Various specific embodiments of the device include specific needle member moving means and response mechanisms. One specific embodiment is directed to a combination of a hollow needle member mounted for reciprocation along with a cutting mechanism both of which are automatically controlled through the use of a controller.

3,731,649

RIBBON-INKING MACHINE

Frank F. Anderson, Montebello, and Albert J. Castro, Cudahy, both of Calif., assignors to Westates Space-Era Products Inc., El Monte, Calif.

Continuation-in-part of Ser. No. 869,465, Oct. 27, 1969, abandoned. This application June 25, 1971, Ser. No. 156,863
Int. Cl. B05c 11/10
U.S. Cl. 118—6 8 Claims



A ribbon-inking machine is disclosed which includes feed means for holding a ribbon so that it may be unwound from a core member, take-up means for winding a ribbon supplied by said feed means, ironing means for ironing a ribbon passing

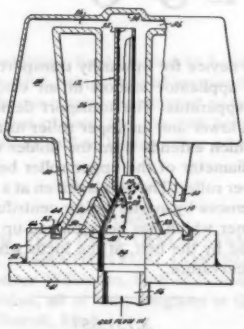
from the feed means to the take-up means and inking means for supplying ink to a ribbon passing from said feed means prior to such a ribbon being ironed by the ironing means. Preferably the inking and ironing means contact the entire width of the ribbon being processed, also the ironing means used preferably applies heat uniformly to all parts of a ribbon across its width and the inking means used preferably is capable of applying ink to a ribbon in accordance with its ability to take up ink into its internal structure.

3,731,650

GAS DISTRIBUTOR FOR CASTING MOLD MANUFACTURE

Wilbur H. Schweikert, and John S. Mosier, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 3, 1971, Ser. No. 195,284
Int. Cl. C23c *13/08*
U.S. Cl. 118—48 **1 Claim**



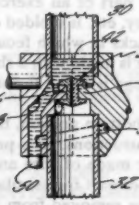
A gas distributor for use in a mold cup and main sprue of a casting mold to be coated internally with a pyrolytic coating includes a gas receiving and distributing nozzle and a main sprue conduit. The nozzle delivers gas to the cup through a plurality of discharge holes and the conduit delivers gas to the base of the main sprue. Hole outlets deliver such gas angularly along the cup toward the main sprue to avoid turbulent flow.

3,731,651

REACTOR SEAL

Donald K. Kuehl, Manchester, Conn.; Harry A. Nutter, Longmeadow, Mass., and Raymond C. Smart, Hazardville, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 14, 1970, Ser. No. 97,697
Int. Cl. C23c *13/10*
U.S. Cl. 118—49.5 **5 Claims**



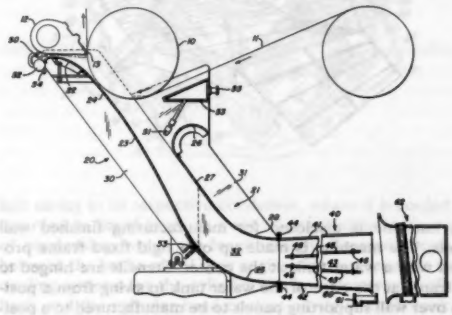
In a vertical reactor wherein vapor deposition is effected on a moving filamentary substrate, a reactor seal is provided to isolate the reactant gases within the tube from the atmosphere. The reactor seal comprises an orificed fitting containing a well of liquid metal through which the filament is drawn, the liquid metal being held in the well at the orifice by surface tension forces. The orifice is established as a groove between abutting antipodal inserts which are removable in opposite directions and the liquid metal supporting surface of the well is sloped downwardly to provide complete drainage for rethreading.

3,731,652

COATING DOCTOR APPARATUS

Imants Reba, Vancouver, Wash., and Edward C. Wolthausen, Oaklawn, Ill., assignors to The Black Clawson Company, Hamilton, Ohio

Continuation of Ser. No. 28,741, April 15, 1970, abandoned. This application Jan. 24, 1972, Ser. No. 220,192
Int. Cl. B05c *11/06*
U.S. Cl. 118—63 **11 Claims**



In coating doctor apparatus in which an air doctor is used to remove coating from a freshly coated web trained about a backing roll, internal baffles are eliminated and the contours of the coating return chamber are designed using flow control principles so that strong vortices and attendant misting are avoided in the coating return chamber, while at the same time subambient pressures generated along the curved surfaces of the chamber cause strong entrainment of air through the spaces between the edges of the coating chamber and the backing roll and air doctor and prevent coating material from escaping from the coating system.

3,731,653

COATING RATE CELL

James F. Leland, Detroit; William S. Russell, Warren, and James G. Mabarak, Grosse Pointe, all of Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

Division of Ser. No. 650,844, July 3, 1967, Pat. No. 3,597,284. This application April 7, 1971, Ser. No. 132,240
Int. Cl. B05c *3/04*
U.S. Cl. 118—429 **1 Claim**

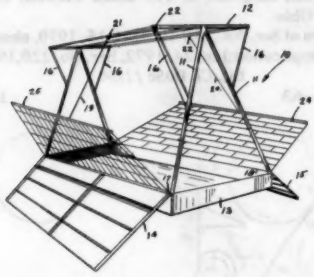
An open top coating cell defining a slot. A plurality of apposed ribs are disposed on the inner side walls of the cell to form expansion chambers whereby turbulence is imparted to treating liquid passing through said cell.

3,731,654

STENCIL DEVICE WITH MEANS TO CLEAN

Albert Kirsch, Erie, Pa., assignor to Instant Brick Enterprise, Inc., Erie, Pa.

Filed Feb. 28, 1972, Ser. No. 229,637
Int. Cl. B05b *15/04*
U.S. Cl. 118—504 6 Claims



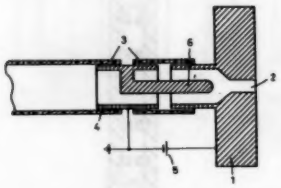
A machine is disclosed for manufacturing finished wall panels. The machine is made up of a rigid fixed frame provided with a water tank at the center. Stencils are hinged to the frame at the edge of the water tank to swing from a position over wall supporting panels to be manufactured to a position in the tank to be washed. The stencils may be made of a rigid material such as one-eighth inch steel cut out in the form of the pattern desired on the article to be prepared. When the stencils are swung down over a panel, such as a 4 × 8 piece of plywood, the stencil rests on the plywood. Thus a plaster material may be sprayed over the stencil and into the spaces between the pattern and the stencil may then be swung up into the tank leaving a brick panel where the margins of the cutout portions forming simulated plaster joints and the excess plaster may be washed off in the tank of water.

3,731,655

APPARATUS FOR MARKING INSULATED ELECTRICAL CONDUCTORS

Otto Griesser, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 24, 1971, Ser. No. 118,240
Claims priority, application Germany, March 14, 1970, P 20 12 175.9
Int. Cl. B05c *5/02*
U.S. Cl. 118—624 6 Claims



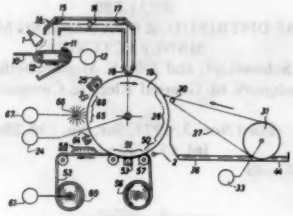
The deflection of color band marking material applied to cable is controlled by applying an electrical charge to the material. A direct voltage is applied between a nozzle and an annular electrode within the color material supply line to prevent variations of the sinusoidal deflection of different materials and of the same material at different times.

3,731,656

TRANSPORT DEVICE FOR PHOTOGRAPHIC DEVELOPMENT APPARATUS

Karel Frans De Troeyer, B 2000 Antwerpen, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

Filed March 30, 1971, Ser. No. 129,333
Claims priority, application Great Britain, March 31, 1970, 15,195/70
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 13 Claims



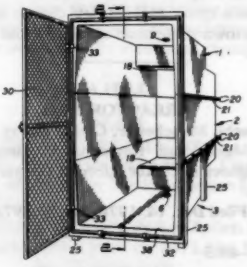
A transport device for upwardly transporting toner from a holder to an applicator station in an electrophotographic development apparatus. The transport device comprises an endless belt, a lower and an upper roller to determine a path for the belt which extends from the holder to the applicator station. The diameter of the upper roller being smaller than that of the lower roller. The belt is driven at a velocity which is sufficient to remove by inertia and/or centrifugal force at least part of the toner which has been picked-up from the holder and transported by the belt, at the locus where the belt performs a sharp curvature.

3,731,657

ANIMAL CAGE

Eugene T. Alessio, 20 Harmony Hills Road, Akron, Ohio

Filed April 1, 1971, Ser. No. 130,210
Int. Cl. A01k *01/02*
U.S. Cl. 119—17 16 Claims



At least the lower part of an exercise cage for an animal such as a dog, monkey, etc. is molded of reinforced plastic so that there are no cracks in which fecal matter, bacteria, etc. can collect. The cage is made with a shelf that the animal can get onto while the cage is being flushed out. A drain is provided in the floor.

In addition to the bottom portion, there may be other portions of various constructions. In a preferred cage the walls and roof are solid or made of wire and the cage is provided with a fan in the upper part for ventilation so that air flushed from the cage can be removed from the cage environment. The only opening into this cage is advantageously a single door at the opposite end of the cage from the fan.

In a preferred form of the invention, top and bottom portions of the cage are identical and can be nested for shipment or storage.

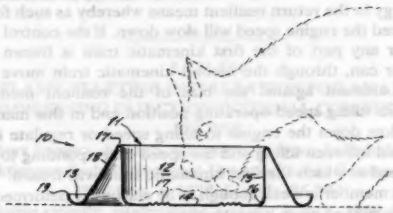
Various modifications are disclosed.

3,731,658

DISPOSABLE PET AND ANIMAL DISH

Keith Livermore, and Donna Livermore, both of P.O. Box 575, Moscow, Idaho

Filed Aug. 17, 1971, Ser. No. 172,437
Int. Cl. A01k 5/00
U.S. Cl. 119—61 1 Claim



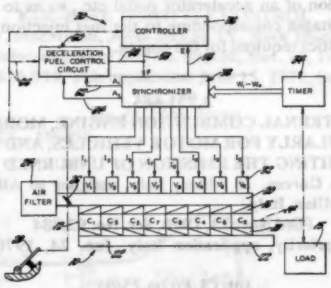
A dish for containing foods served to household pets or other animals, the dish being made of inexpensive material so that after a single use it can be discarded so to eliminate the need to wash dishes of pets, and the dish being designed so that it will not tip as well as having other advantageous features.

3,731,659

ELECTRONIC FUEL INJECTION SYSTEM HAVING DECELERATION FUEL CONTROL

Paul N. Barr; Lester Wilkinson, both of Kokomo, and Stuart M. Neal, Sheridan, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 7, 1971, Ser. No. 178,271
Int. Cl. F02m 51/00
U.S. Cl. 123—32 EA 4 Claims



Fuel is completely withheld from an internal combustion engine in response to a decrease in the demand for power from the engine when the engine speed is above the idle speed of the engine.

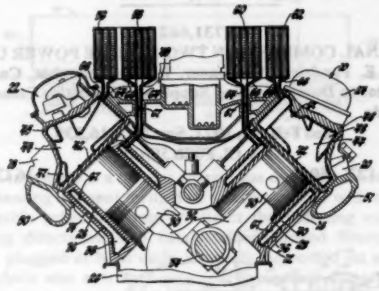
3,731,660

VAPOR-COOLED INTERNAL COMBUSTION ENGINE

Charles B. Leffert, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 29, 1971, Ser. No. 213,446
Int. Cl. F01p 3/00
U.S. Cl. 123—41.42 7 Claims

An internal combustion engine is provided with separate sealed cooling systems for each of the cylinder block and cylinder head coolant cavities, each system having its own vapor condenser. The condensers are connected with their respective coolant cavities, the connections including wick means to aid the return of liquid coolant to additional wick means within the cavity for vaporization, which occurs on the heated walls, such as the cylinder walls and combustion walls of the cylinder heads. An open flow path is maintained adjacent the wicks for passage of coolant vapor from each coo-



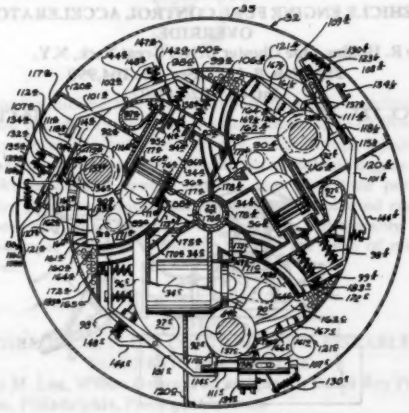
lant cavity to its respective condenser, where it is cooled and returned to liquid form. In a specific embodiment, four rows of condensing means are longitudinally disposed above and between the banks of a V-type engine, forming separate sealed cooling systems for the cylinder block coolant cavity of each bank and the cylinder head coolant cavity of each bank. An engine driven blower directs air through suitable ducts to pass longitudinally through the four condenser rows so as to dissipate heat therefrom.

3,731,661

ROTARY ENGINE APPARATUS

Thomas J. Hatfield, 39536 Sundale Drive, and Gus C. Robertson, 4346 Cambria Street, both of Fremont, Calif.

Continuation-in-part of Ser. No. 856,244, Aug. 11, 1969, abandoned. This application Dec. 27, 1971, Ser. No. 212,168
Int. Cl. F02b 59/00, 41/10, 37/00
U.S. Cl. 123—43 C 12 Claims



Rotary engine apparatus of the internal combustion type in which the reciprocable displacements of the respective pistons within the cylinders therefor impart rotatory motion to a variety of engine components from which output torque is delivered to a power shaft. The rate at which the piston-cylinder structures fire is selectively variable at any engine

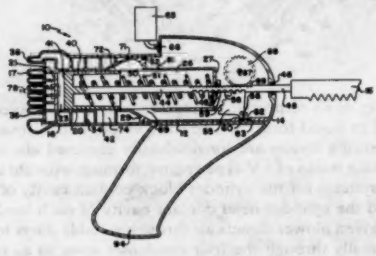
operating speed so that the power delivered by the engine at any speed thereof can be specifically related to the contemporary value of the load on the engine. The stroke length of each reciprocable piston is also selectively variable for load-accommodating purposes; and the rotatory components of the apparatus may be used directly to drive an output power shaft selectively in opposite angular directions, thereby obviating the necessity of providing transmission mechanism for this purpose.

3,731,662

INTERNAL COMBUSTION TWO-STROKE POWER UNIT

Helmut E. Fandrich, Vancouver, British Columbia, Canada, assignor to Dueck Building Supplies Ltd., British Columbia, Canada

Filed Feb. 18, 1971, Ser. No. 116,339
Int. Cl. F02b *59/00*
U.S. Cl. 123—50 B **36 Claims**



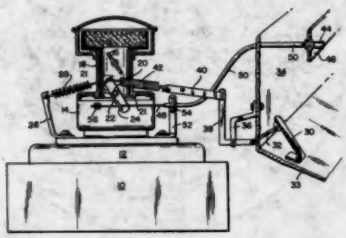
An internal combustion, two-stroke power unit having a cylinder element mounted for reciprocation in a base and a piston element mounted for reciprocation in the cylinder element, said elements reciprocating relative to each other in opposite directions, interconnecting means between the two elements to cause them to reciprocate in phase with each other, power take-off means connected to one of these elements, and an arrangement for automatically throttling the unit when it is operating under partial- and no-load conditions.

3,731,663

VEHICLE ENGINE FUEL CONTROL ACCELERATOR OVERRIDE

Jesse R. Hollins, One Chester Drive, Great Neck, N.Y.

Filed Jan. 8, 1971, Ser. No. 104,990
Int. Cl. F02d *11/02*
U.S. Cl. 123—98 **16 Claims**



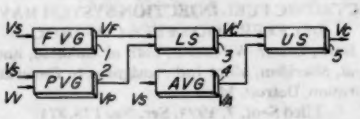
Apparatus for controlling the position of an accelerator control element of a vehicular engine when the mechanism conventionally employed for moving the same has frozen. The apparatus includes a resilient member in a first kinematic train between said element and the accelerator pedal or like element usually employed by the vehicle operator to regulate the engine speed. The resilient member is connected to said element directly or through non-freezable components. A return resilient means which is substantially weaker than the resilient member biases the accelerator control element to an idle position. A second kinematic train is so arranged that when actuated by the vehicle operator it will positively move the accelerator control element toward its idling speed operating position. In normal use a force is applied through the first kinematic train and resilient member to move the accelerator control element in an engine speed-up direction while storing up energy in the return resilient means whereby as such force is reduced the engine speed will slow down. If the control element or any part of the first kinematic train is frozen the operator can, through the second kinematic train move the control element against the bias of the resilient member toward its idling speed operating position and in this manner either slow down the engine to idling speed or regulate it to any speed between idling and the speed corresponding to engine speed at which the first kinematic train was frozen. The resilient member is weak enough to be elastically deformed by the force applied by an operator through the second kinematic train.

3,731,664

CONTROL VOLTAGE GENERATOR FOR ELECTRICAL FUEL CONTROL SYSTEM

Yoshihiko Tsuzuki, Kariya, and Nobuhito Hobo, Inuyama, both of Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan

Filed March 10, 1971, Ser. No. 122,661
Int. Cl. F02m *51/00*
U.S. Cl. 123—102 **1 Claim**



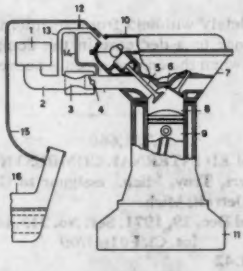
A control voltage generator for receiving input signals representing the various operating conditions of a diesel engine, that is, the rotational speed of the engine and the degree of depression of an accelerator pedal etc., so as to generate control voltages corresponding to the fuel injection quantity characteristics required for the engine.

3,731,665

INTERNAL COMBUSTION ENGINE, MORE PARTICULARLY FOR MOTOR VEHICLES, AND MEANS FOR LIMITING THE EMISSION OF UNBURNED GASES

Giampaolo Garcea, 18 Milan, Italy, assignor to Alfa Rome. S.P.A., Milan, Italy

Filed Nov. 23, 1970, Ser. No. 92,084
Claims priority, application Italy, Jan. 24, 1970, 19766 A/70
Int. Cl. F02m *25/08*
U.S. Cl. 123—136 **1 Claim**



A system for diminishing atmospherical pollution due to the discharge of unburned gases and volatile fuels from motor cars

in which an internal combustion engine already equipped with ducts connecting the base chamber of the engine with the intake manifold and the fuel tank has the end portion of the duct which connects the fuel tank to the inside chamber of the engine base is joined to the end portion of the duct connecting the intake manifold with the chamber. Hence, when the engine is not running, all the gases and vapors are stored in the interior chamber of the engine base, whereas, as soon as the engine runs, all gases and vapors are sucked by the engine cylinders to be burned therein.

3,731,666

FLAME STARTING INSTALLATION FOR AN AIR-COMPRESSING INJECTION INTERNAL COMBUSTION ENGINE

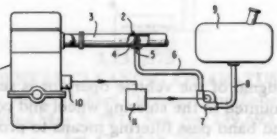
Herbert Langen, Altbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 4, 1970, Ser. No. 86,784

Claims priority, application Germany, Nov. 4, 1969, P 19 55 379.8

Int. Cl. F02m *31/04*

U.S. Cl. 123—179 H **5 Claims**



A flame-starting installation for an air-compressing injection internal combustion engine with a feed of the fuel by an electrically driven feed pump, in which the fuel rate feed of the fuel pump is a nonlinear function of the engine rotational speed over at least a portion of the entire rotational speed range of the engine.

3,731,667

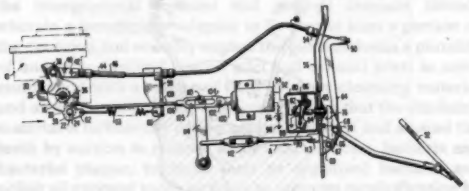
FAIL-SAFE THROTTLE CONTROL

Charles W. MacMillan, 3400-20th St. Ct., Rock Island, Ill.

Continuation-in-part of Ser. No. 88,450, Nov. 10, 1970, Pat. No. 3,626,919. This application June 15, 1971, Ser. No. 153,330

Int. Cl. F02b *77/00*

U.S. Cl. 123—198 DB **23 Claims**



The invention relates to a fail-safe throttle control mechanism which is positioned between an accelerator pedal of a motor vehicle and the linkage extending to the carburetor thereof and includes a sensing mechanism for disengaging the accelerator pedal from the throttle valve so that the engine of the motor vehicle can instantly return to an idle condition irrespective of any impairment in the carburetor linkage or blockage of the accelerator pedal. There are disclosed various embodiments for achieving this fail-safe throttle control through electrical as well as mechanical mechanisms.

3,731,668

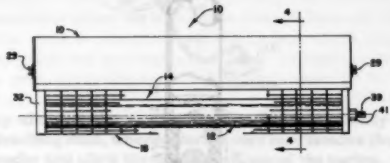
CATALYTIC HEATER

Jay N. Smith, Wichita, Kans., assignor to Impala Industries, Inc., Wichita, Kans.

Filed May 19, 1971, Ser. No. 144,895

Int. Cl. F24c *3/04*

U.S. Cl. 126—92 R **8 Claims**



The invention is a tubular shaped gas operated thermocatalytic heating element formed of a ceramic fiber with a pair of adjustable reflector wings to direct the radiating energy in varying directions. The catalyst impregnated fiberous element, plugged at both ends, is axially supported on a hollow rod which also acts as a manifold for evenly dispersing the gaseous fuel through the porous element; the coupling at one end, between the rod and element, allows longitudinal movement therebetween so that expansion of the support rod is not transmitted to the element.

3,731,669

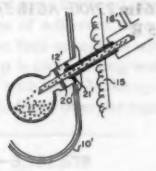
EXTERNAL IMPLANTATION OF ENERGY TO POWER INTERNAL DEVICES

Joseph J. Fitzgerald, Winchester, Mass., assignor to Sander Nuclear Corporation, Nashua, N.H.

Filed Oct. 16, 1970, Ser. No. 81,432

Int. Cl. A61b *06/00, 19/00*

U.S. Cl. 128—1 R **15 Claims**



A means and method is used to permit injection and/or extraction of radioisotopic energy source material to or from an energy source implanted in the body. Radioisotope injections are used to maintain energy sources for prosthetic organs and the like at desired energy outputs over long time periods thereby permitting minimization in size of implanted energy sources and maximization of economy. Preferably the radioisotopic material is thulium 171 in the form of microspheres.

3,731,670

CORPOREAL FLUID CONTROL USING BISTABLE MAGNETIC DUCT VALVE

James M. Loe, Willow Grove, Pa., assignor to David Roy Pressman, Philadelphia, Pa., a part interest

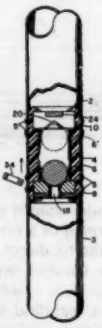
Filed May 3, 1971, Ser. No. 139,711

Int. Cl. A61b *19/00*

U.S. Cl. 128—1 R **24 Claims**

A binary duct valve comprising a tubular housing containing a magnetically sensitive closure member (e.g., a spheroid) small enough to move freely in said housing, and a pair of magnetized valve seats positioned at the respective ends of said housing, one seat having an aperture therethrough which

is shaped to become sealed, thereby to occlude said housing when said closure member sits thereon, the other seat being shaped so that it does not occlude said housing, even when said closure member sits thereon. The valve is operated by directing the closure member to a selected seat by means of magnetic force from an external source. The valve may be used advantageously in conjunction with an extracorporeal



magnetic source for binary control of fluid flow. Preferably a valve is mounted to both vasa deferentia or fallopian tubes to serve as a contraceptive or selective fertility control device, but it may also be mounted, inter alia, in the urethra for controlling urinary incontinence, in penile veins to selectively induce tumescence, or in any duct or tube in which fluid flow is to be controlled by means essentially entirely without said duct or tube.

3,731,671

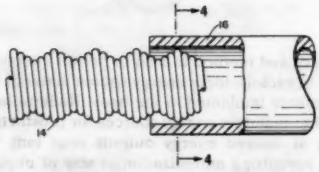
LOW-FRICTION CATHETER GUIDE

Nelson H. Mageoh, 3301 N.E. 5th Avenue, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Oct. 21, 1971, Ser. No. 191,186

Int. Cl. A61m *23/00*; A61b *5/02, 17/00, 5/10*

U.S. Cl. 128—2.05 R **7 Claims**



A low-friction catheter guide for facilitating the insertion of catheters into the vascular system of human beings or animals, especially where insertion through relatively long lengths of blood vessels is involved. Friction is minimized by forming a catheter guide over which the lumen of the enclosing catheter passes and contact between the two is reduced to a series of point contacts. The guide is formed in such a fashion that a series of radial extensions or protuberances constitute the contact areas. A preferred method of forming the guide is by winding a wire upon a non-circular mandrel and permitting the coil to unwind slightly after it is removed from the mandrel. The unwinding or springback results in adjacent convolutions of the coil being rotated slightly with respect to each other.

3,731,672

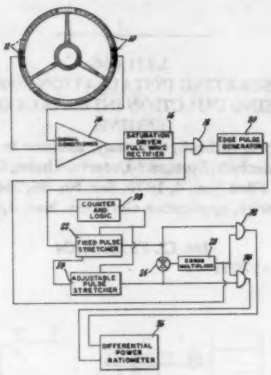
HEART MONITORING APPARATUS FOR A MOTOR VEHICLE

Duane E. McIntosh, Palmyra, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1971, Ser. No. 185,942

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.06 A **3 Claims**



The EKG signal of the vehicle operator is sensed through electrodes mounted in the steering wheel and conditioned by amplifying and band pass filtering means to produce a signal which is substantially the QRS complex of the EKG signal. The width of the QRS complex is continually compared with the nominal width for the vehicle operator and an indication of whether the width is narrower or wider is provided to the operator.

3,731,673

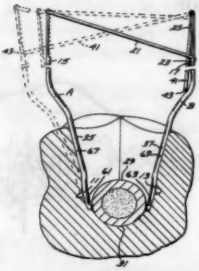
SELF-RETAINING MUSCLE RETRACTOR

William X. Halloran, 440 Fair Drive, Costa Messa, Calif.

Continuation-in-part of Ser. No. 773,750, Nov. 6, 1968, abandoned. This application March 29, 1971, Ser. No. 128,954

Int. Cl. A61b *17/02*; A61m *29/00*

U.S. Cl. 128—20 **12 Claims**



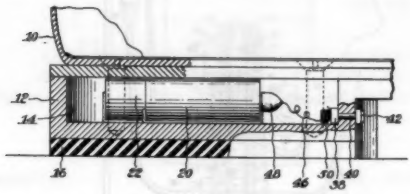
A self-retaining muscle retractor including a pair of elongated members formed on their respective one extremities with bone-engaging portions and on their respective opposite extremities with lever arms. One of the lever arms has one end of a rigid brace pivotally connected thereto and the free end of such brace is engageable with a latching element included on the other lever arm whereby the bone-engaging portions may be inserted in an incision and engaged on opposite sides of a bone, the lever arms spread apart to retract the muscles away from such bone and the free end of the brace engaged with the latching element to maintain the incision open for convenient access to the bone.

3,731,674

SHOE WITH NERVE AND MUSCLE RELAXANT

Don M. Parvin, P.O. Box 724, Defiance, Ohio

Filed Aug. 3, 1971, Ser. No. 168,586
Int. Cl. A61h 1/02
U.S. Cl. 128—25 B 4 Claims



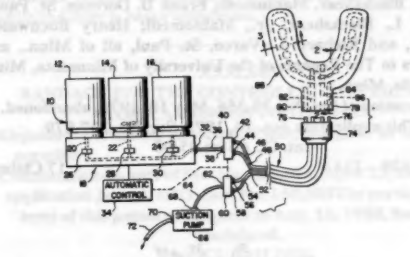
The heel of a shoe contains a battery and electrically powered motor means connected in circuit by a manually operated on-off switch. When the switch is closed, the means produces vibrations transmitted through the feet of the wearer to the rest of the body, promoting a relaxing action on nerves and muscles.

3,731,675

DENTAL CLEANING APPARATUS

James J. Kelly, Box 551, Fort Clayton, CanalZone

Filed May 3, 1971, Ser. No. 139,692
Int. Cl. A61h 7/00
U.S. Cl. 128—62 A 13 Claims



Apparatus for cleaning and polishing teeth and particularly the interproximal surfaces and gingival crevices thereof wherein a mouthpiece adapted to fit over at least a portion of the dentition and sealably engage the gums includes a plurality of interiorly disposed spaced inlet and exhaust ports in communication with a source of fluid or other cleansing material and an evacuation pump, respectively, such that the cleansing material is turbulently drawn against, between and around the teeth by suction to remove small food particles, bacteria and bacterial plaque, bacterial matt or organized bacteria and polish all exposed tooth surfaces to promote recalcification by normal defense mechanisms of the body without the cleansing materials and foreign matter being forced into or entrapped under the soft tissues of the mouth.

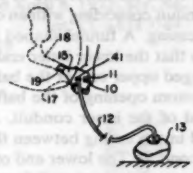
3,731,676

PORTABLE COMPACT ELECTRIC DOUCHE

Jerome E. Rebold, Timonium Md., assignor to Leonard Bloom, Baltimore, Md., part interest

Filed May 6, 1971, Ser. No. 140,912
Int. Cl. A61h 9/00
U.S. Cl. 128—66 17 Claims

A portable compact electric douche is intended to be held directly in the user's hand and has means thereon intended for insertion directly into the vagina. The electric douche is small, lightweight, convenient to hold, battery-powered for electrical safety, and is designed for mass production. Stopper means are provided for optional engagement with the vaginal lips,



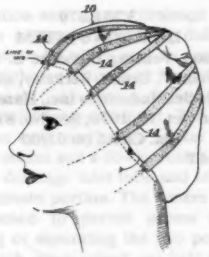
thereby allowing the vaginal tract to be substantially filled with douching fluid, whereupon the user may remove the electric douche and allow the fluid to pass out of the vagina.

3,731,677

FACE LIFTING TECHNIQUE

Mary Salvati, 611 Maplewood, Peekskill, N.Y.

Filed May 10, 1971, Ser. No. 141,804
Int. Cl. A61f 5/08
U.S. Cl. 128—76 B 3 Claims



A stocking cap is placed over the head of a user with all hair tucked thereunder. Strips of adherent tape are then secured both to the cap and to the face in regions where facial uplift is desired. The stocking cap is close-fitting and the loose end at the top is strapped down with tape. Make up is then applied as needed and finally a wig is fitted over the cap.

3,731,678

SMOKE INHALATION PROTECTOR

Robert Pyzel, New York, N.Y., assignor to Phyllis Pyzel, New York, N.Y., a part interest

Filed March 5, 1971, Ser. No. 121,447
Int. Cl. A62b 7/10, 23/00
U.S. Cl. 128—147 12 Claims

A respirator for removing or reducing the smoke and noxious fumes content of air comprises an outer casing having a

tubular nozzle that extends through an opening formed in the top of the casing downwardly a shirt distance into the upper end portion of the casing. An inner conduit is disposed within the outer casing, the upper end of the conduit being spaced a short distance away from the lower end of the nozzle and the lower end of the conduit coinciding with an opening formed in the bottom of the casing. A funnel-shaped baffle is disposed within the casing so that the lower inner end of the nozzle extends into the enlarged upper end of the baffle coincides and so that the small bottom opening of the baffle coincides with the open upper end of the inner conduit. A filter retaining member is disposed in the casing between the casing and the upper of the inner conduit. The lower end of the outer casing and the filter retaining member are each formed with a plurality of small air passage openings, and the space between the outer casing and the inner conduit is filled with air distribution means and an air purification material. When the user of the respirator inhales through the nozzle of the device inhalation valve means automatically open and exhalation valve means automatically close so that air is drawn through the air passage openings formed in the filter retaining member, and when the user exhales the inhalation valve means automatically close and the exhalation valve means automatically open so that moisture laden air is expelled directly into the inner conduit and thence to the atmosphere.

3,731,679

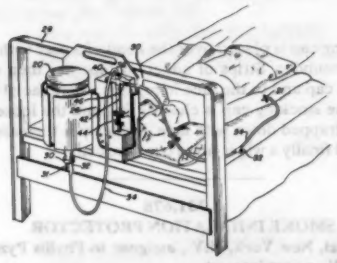
INFUSION SYSTEM

Jack L. Wilhelmson, Fenton; Theodore E. Weichselbaum, St. Louis, and Vernon F. Braun, Berkeley, all of Mo., assignors to Sherwood Medical Industries Inc., Hazelwood, Mo.

Filed Oct. 19, 1970, Ser. No. 81,926

Int. Cl. A61m *05/00*

U.S. Cl. 128—214 F **10 Claims**



A portable infusion system uses a disposable piston type syringe as a positive displacement pump. The syringe piston is reciprocally driven by a bidirectional DC motor under control of a battery powered circuit. Different selectable rates of pumping are maintained by controlling the width of bidirectional DC pulses coupled to the DC motor and by monitoring the motor back EMF during the off-time of the pulses. A disposable two-way valve connects the syringe pump with a fluid source and a catheter. Safety circuits protect against deleterious conditions such as the passage of an air bubble or an over-pressure condition.

3,731,680

PRESSURE REGULATING CONTROLLER

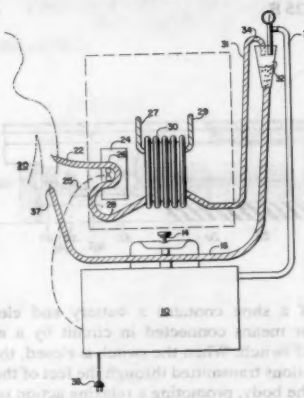
Floyd A. Wright, 3132 Bonanza Road, Charleston, S.C., and Thomas S. Hargest, 1078 Winslow Drive, Charleston, S.C.

Filed Oct. 21, 1971, Ser. No. 191,307

Int. Cl. B01d *31/00, 13/00;* **A61b** *19/00, 5/02*

U.S. Cl. 128—214 E **7 Claims**

The invention disclosed is for a pressure monitor and control device having particular utility in medical technology were constant monitor of hydro-static pressure is required.



The disclosed device is especially useful in a method for effecting extra-corporeal hemodialysis.

3,731,681

IMPLANTABLE INDUSION PUMP

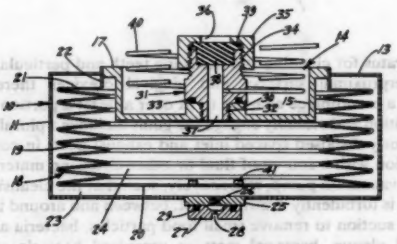
Perry J. Blackshear, Mahtomedi; Frank D. Dorman, St. Paul; Perry L. Blackshear, Jr., Mahtomedi; Henry Buchwald, Edina, and Richard L. Varco, St. Paul, all of Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 38,356, May 18, 1970, abandoned.

This application Jan. 14, 1972, Ser. No. 217,879

Int. Cl. A61m *05/00*

U.S. Cl. 128—214 F **17 Claims**



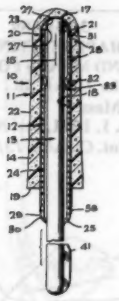
An implantable pump for infusing drugs or other chemicals or solutions into the body at a uniform slow flow rate. The pump comprises a housing divided into two chambers separated by a bellows, diaphragm or other pressure-communicating interphase. A volatile liquid partially filling one chamber provides 9 constant pressure energy source to act upon the interphase to force liquid infusate from the other chamber through a capillary tube or other flow-regulating resistance element to the infusion site. The infusate chamber is closed as by means of a self puncture sealing refill stopper. The pump is implanted with the refill stopper disposed under the skin and the pump is refilled periodically by injection through the skin.

3,731,682

VAGINAL TREATMENT ASSEMBLY

Sol B. Fielding, 11930 Kearsarge Street, Los Angeles, Calif.

Filed Aug. 9, 1971, Ser. No. 170,218
Int. Cl. A61b *19/00*; A61m *3/00, 7/02*
U.S. Cl. 128—239 20 Claims



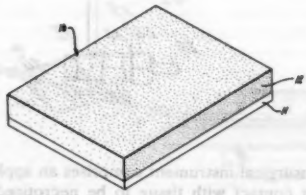
A vaginal treatment assembly including an outer cushion body dimensioned for reception within the human vaginal cavity, and containing an essentially tubular liner which projects into a passage in the cushion body and is withdrawable therefrom, together with an elongated member which projects into one end of the liner and extends through the interior of the liner and then through an opening at its opposite end, to engage an end wall of the cushion body in a relation retaining the latter against unwanted removal from the vaginal cavity while the liner is being withdrawn.

3,731,683

BANDAGE FOR THE CONTROLLED METERING OF TOPICAL DRUGS TO THE SKIN

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation

Continuation-in-part of Ser. No. 136,981, April 23, 1971. This application June 4, 1971, Ser. No. 150,085The portion of the term of this patent subsequent to Aug. 10, 1988, has been disclaimed.
Int. Cl. A61f *7/02*
U.S. Cl. 128—268 14 Claims



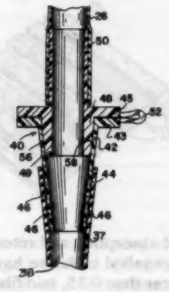
Bandage for the topical administration of controlled therapeutically effective quantities of topically active drugs has a backing member, a pressure-sensitive adhesive, and a reservoir layer containing a topically active drug confined within a wall member. The wall member is formed from drug release rate controlling material to continuously meter the flow of a therapeutically effective amount of the drug through the wall to the skin at a controlled and predetermined rate over a period of time.

3,731,684

CLOSED IRRIGATION AND URINARY DRAINAGE SYSTEM APPARATUS

Ronald E. Spiegel, Chicago, Ill., assignor to Cenco Medical Health Supply Corporation, Chicago, Ill.

Filed April 8, 1971, Ser. No. 132,421
Int. Cl. A61f *5/44*
U.S. Cl. 128—275 7 Claims



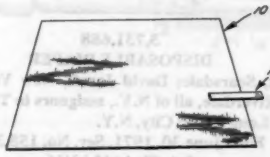
A closed irrigation and urinary drainage system apparatus having a catheter means for removing fluids from a patient and a drainage inlet tube which may be connected or disconnected from the catheter means by a hinged connector means for transferring such fluids into a distensible collection bag having an outlet tube for emptying it. The hinged connector means includes an upstream hollow socket portion insertable into the catheter means and a downstream adapter portion insertable into the drainage inlet tube and attached by a hinge means to the upstream portion. The system may be closed for drainage or opened to permit access for irrigation by swingably joining or separating the two portions of the connector means which, when joined, are held in fixed and sealed relationship by interior interlocking ring and groove means.

3,731,685

MOISTURE INDICATING STRIP FOR DIAPERS AND SURGICAL DRESSINGS

William Eldus, 2 Essex Lane, Suffern, N.Y.

Filed April 1, 1971, Ser. No. 130,305
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 19 Claims



A moisture indicating strip for use with diapers, surgical dressings and the like. One end of the strip is attached to the garment whose wet condition is to be detected. The other end of the strip is impregnated with a chemical which changes color when wet. The strip is capable of supporting capillary action so that moisture in the garment is transported to the chemical which then changes color so that the wet condition of the garment can be verified visually.

3,731,686

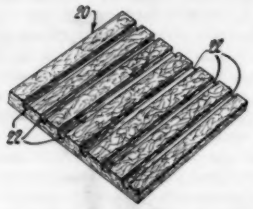
FLUID ABSORPTION AND RETENTION PRODUCTS AND METHODS OF MAKING THE SAME

Prondy Kumar Chatterjee, Spotswood, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 03, Feb. 10, 1969. This application March 22, 1971, Ser. No. 126,743

Int. Cl. A61f 13/20

U.S. Cl. 128—285 9 Claims



Improved fluid absorption and retention products comprising fibrous carboxyalkyl cellulose having average degrees of substitution greater than 0.35, said fibrous carboxyalkyl cellulose having been heat-treated to render it water-insoluble and in compressed form to increase its fluid absorption and retention properties.

3,731,687

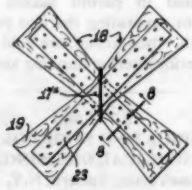
CATAMENIAL TAMPON

Jacob A. Glassman, 1680 Meridian Avenue, Miami Beach, Fla.

Filed July 16, 1971, Ser. No. 163,270

Int. Cl. A61f 13/20

U.S. Cl. 128—285 8 Claims



A catamenial tampon comprised of plural strips of moisture absorbent material, one of which may be highly compressed and arranged so that upon being wetted the tampon will forcibly expand to fill or substantially fill the vaginal passage to prevent spill-over and leakage.

3,731,688

DISPOSABLE DIAPER

Donald Litt, Scarsdale; David Jaroff, New York, and Amos Shamir, Riverdale, all of N.Y., assignors to Techmation Corporation, Long Island City, N.Y.

Filed June 30, 1971, Ser. No. 158,370

Int. Cl. A61f 13/16

U.S. Cl. 128—287 11 Claims

A disposable diaper comprises a rectangular absorbent pad which is longitudinally folded, at least at its crotch region, into a box-pleat configuration, and a flexible, moisture impervious backing sheet underlying the pad and being secured to the latter along the opposite marginal side portions of the pad, the backing sheet being longitudinally folded independently of the pad, at least at its crotch region, into a Z-shaped fold which underlies the central portion of the pad and which reduces the effective width of the backing sheet substantially to the same extent that the box-pleat configuration reduces the effective width of the pad.

3,731,689

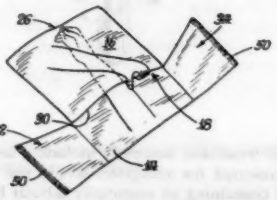
DISPOSABLE DIAPER HAVING AN INTEGRAL CONTAINER AND MEANS FOR APPLICATION

Charles H. Schaar, Lake Zurich, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Feb. 1, 1971, Ser. No. 111,188

Int. Cl. A61f 13/16

U.S. Cl. 128—287 8 Claims



An improved self-containable disposable diaper wherein a portion of the disposal pouch is slit so as to form integral, oppositely extending wings, the wings preferably having means thereon for completing the attachment of the diaper to an infant. A method is provided for forming the improved diaper featuring folding, slitting and refolding the portion thereof which is to define the pouch and wings.

3,731,690

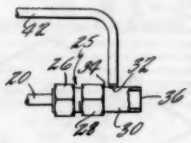
VENTING CRYOSURGICAL INSTRUMENT

Michael D. Bryne, Vernon, Conn., assignor to Brymill Corporation, Vernon, Conn.

Continuation-in-part of Ser. No. 886,260, Dec. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 728,536, May 13, 1968, abandoned. This application Nov. 9, 1971, Ser. No. 197,079

Int. Cl. A61b 17/36

U.S. Cl. 128—303.1 4 Claims



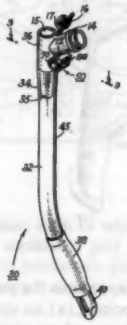
A cryosurgical instrument comprises an applicator pressed into firm contact with tissue to be necrotized, a stream of liquified gas coolant (such as nitrogen) being delivered to the applicator. In one embodiment, the invention provides venting of vapors from the chambers through a vent-extending tube attached to the applicator. In one embodiment, the cryogenic application chamber comprises an open ended chamber connected to a source of pressurized coolant, the distal end of the chamber being open and adapted for application to a subject, the proximal end adapted for connection with the source, there being a vent tube through the wall of the chamber near the proximal end. Another embodiment employs a closed-wall chamber.

3,731,691

ENDOTRACHEAL TUBE AND CONNECTOR UNIT

Allen Chen, Belleville, Mich., assignor to Lorton Laboratories, Ltd., New York, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,163
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 16 Claims



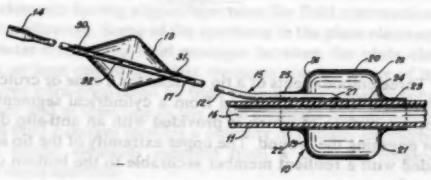
A device for the endotracheal administration of a gaseous anesthetic has a flexible tube for insertion into the trachea, including an inflation cuff integrally joined with and surrounding the tube adjacent the distal portion thereof, and an inflation duct formed in the tube and isolated from the interior thereof, which duct extends from the cuff to proximal portions of the tube and through which inflation air may be supplied to the cuff. The proximal portions of the tube are integrally joined with a rigid connector having a valve member in air communication with the inflation duct for controlling the supply of inflation air to the cuff.

3,731,692

TRACHEOTOMY OR ENDOTRACHEAL TUBE CUFF

Chalmers M. Goodyear, Coopersburg, Pa., assignor to The Foregger Company, Inc., Smithtown, N.Y.

Filed March 19, 1971, Ser. No. 126,207
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 8 Claims



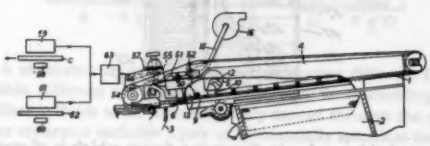
An inflatable cuff for use in combination with a ventilation tube inserted into the trachea of a patient, a major portion of the outer surface of the inflated cuff sealingly engages the trachea gently enough to avoid distortion of, or trauma to the sensitive trachea wall. The cuff is of flexible material having thickness between 0.005 and 0.01 inch and, when inflated outside the trachea, the cuff takes the shape of a right cylinder having essentially flat end walls with curved transition portions between the end walls and the straight cylindrical walls.

3,731,693

MACHINE AND METHOD FOR MANIPULATING SHREDDED TOBACCO

Frederick Pocock, Deptford, London, England, assignor to The Molins Organisation Limited, London, England

Filed May 9, 1961, Ser. No. 108,792
Claims priority, application Great Britain, May 10, 1960, 16,460/60
Int. Cl. A24c *05/34*
U.S. Cl. 131—21 B 4 Claims



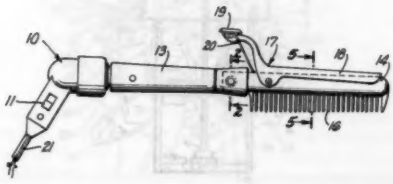
A method and machine for manipulating tobacco having a pneumatic system arranged to feed shredded tobacco upwardly on to the underside of a foraminous conveyor belt mounted below and adjacent to a horizontally elongated suction chamber in order to form a filler stream thereon which is later formed into a wrapped cigarette rod and cut into individual cigarettes. Tobacco is fed to the conveyor in excess of that required in the rod and the excess is removed by trimming in order to obtain uniformity in the rod. Inevitable variations in uniformity in the filler are reduced by controlling the degree of pneumatic compaction of the same by means of detectors which are arranged to manipulate a throttling or needle valve for controlling the degree of suction in the suction chamber thereby controlling the quantity of tobacco remaining between the trimming device and the conveyor and reducing variations in the filler when and if they should occur.

3,731,694

ELECTRICALLY HEATED COMB AND CURLER

Michael David Moro, 152 South Brand Avenue, Glendale, Calif.

Filed Aug. 16, 1971, Ser. No. 172,178
Int. Cl. A45d *25/10*
U.S. Cl. 132—118 9 Claims



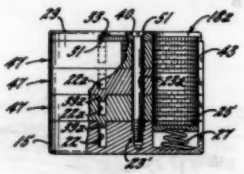
An electrically heated combination hair comb and curling iron. An elongated handle is rotatably mounted with respect to a stationary grip. An elongated heat conductive base extends outwardly from the handle and contains electrically operated heating means. A heat conductive comb extends radially outwardly from the base. A clamp is pivotally mounted on the opposite side of the base from the comb. A section of hair is wound around the comb and base by rotating the handle and base toward the scalp while the hair section is held by the gripping portion of the clamp. The hair is then released by repeated pivotal movements of the clamp to give the hair section a gentle curl or curve. A modified embodiment can be used to straighten the hair.

3,731,695

COIN HOLDER AND COIN DISPENSER

Leo Meijer, Green Bay, Wis., assignor to Synthetic Surfaces Inc., Green Bay, Wis.

Filed Oct. 9, 1970, Ser. No. 79,491
Int. Cl. G07d 1/00
U.S. Cl. 133—6 1 Claim



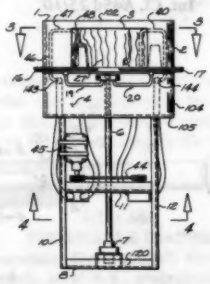
A coin holder and coin dispensing device which is of such size and shape that it will fit conveniently in the hand of the user, and of such construction that it permits the selective dispensing of coins from the holder by movement of the thumb of the hand which holds the dispensing unit. The mechanism consists of a generally circular, box-like base having radially-spaced, vertically-extending, cylindrical passageways formed therein for holding stacks of coins, and a top or cover element that is provided with dispensing slots of such shape that the coins normally are held securely in the device, while at the same time permitting convenient sidewise movement of the coins when dispensing is desired. The coins are held in the dispensing position by being pressed against inwardly extending ledges, provided at the edges of the dispensing slots in the top closure element, by a spring and piston disc arrangement operating in each of the passageways in which the coins are stacked.

3,731,696

GLASS WASHING APPARATUS

Seth L. Hackney, 203 Dale Lane, California, Mo.

Filed March 2, 1971, Ser. No. 120,113
Int. Cl. B08b 3/02
U.S. Cl. 134—80 5 Claims



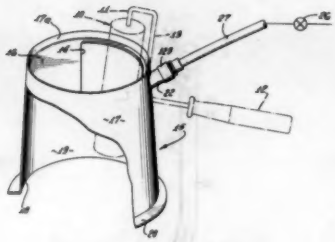
In a washing apparatus, particularly an apparatus designed for the washing of glass tumblers, means are provided for washing the entire glass which includes a platform arranged to be rotated by a motor, the platform having a glass supporting surface containing a multiplicity of openings extending from and through said surface and a lower surface, spray nozzles directed to force liquid through the openings in the platform, and spray devices directed to force liquid down towards the inverted glasses which are placed on the platform, the spray nozzles and spray devices being connected via a conduit to an open-topped reservoir beneath the platform and positioned directly beneath the glass supporting surface, pumps connected to supply liquid from the reservoir to the spray devices and spray nozzles and an enclosure around and above the glass supporting platform. Rotary feed and discharge discs are frictionally driven by the platform.

3,731,697

PAINT ROLLER CLEANING APPARATUS

Albert J. Yost, 42326 North 55 Street West, Quartz Hill, Calif.

Filed Aug. 16, 1971, Ser. No. 172,134
Int. Cl. B08b 3/02
U.S. Cl. 134—138 6 Claims



A paint roller cleaning apparatus for paint rollers rotatably carried on a spindle comprising (a) an upright hood having a fluid passing lower opening, and an upper through opening sized to freely pass a paint roller endwise into a cleaning zone within the hood interior, (b) a nozzle carried by the hood to receive cleaning fluid under pressure, the nozzle having an orifice outlet formed to produce a fan shaped spray of fluid directed to spin the roller to effect centrifugal throw-out of removed paint and fluid to drain down the inside of the hood and through the lower opening, and (c) the spray locus being spaced from the upper opening so that the roller extent spinning in that space may be centrifugally freed of fluid prior to withdrawal from the upper opening.

3,731,698

CANE OR CRUTCH TIP

Gilbert Buchalter, 5551 Prospect Avenue, Newark, N.J.

Filed April 5, 1971, Ser. No. 131,261
Int. Cl. A45b 9/04
U.S. Cl. 135—62 4 Claims

Three embodiments of a tip or head for a cane or crutch are disclosed. The tip is formed from a cylindrical segment, the bottom surface of which is provided with an anti-slip device for engaging the ground. The upper extremity of the tip is provided with a resilient member securable to the bottom of the crutch or cane.

3,731,699

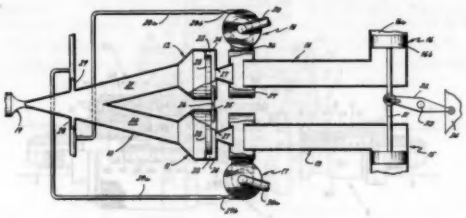
SUPERSONIC POWER AMPLIFIERS

Charles E. Hallum, Irvine, Calif., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Nov. 15, 1971, Ser. No. 198,840
Int. Cl. F15c 1/16
U.S. Cl. 137—809 10 Claims

A two-way diverter valve and amplifier, for use with high velocity, high temperature gases in which relatively weak

pneumatic control signals are amplified, both as to pressure and flow rate, without the use of mechanically moved parts. A bistable fluid amplifier has its branches coupled to vortex fluid amplifiers which include secondary nozzles through which



fluid feeds two conduits each of which terminates in a pneumatic actuator. An additional pair of vortex amplifiers are provided which afford pneumatic pressure relief and prevent overpressure developing in the actuators.

3,731,700

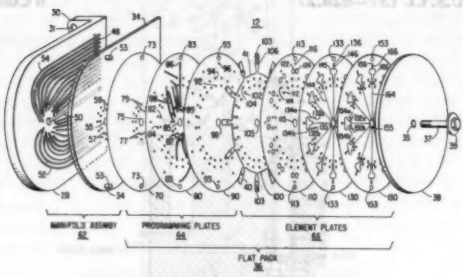
FLUIDIC INTEGRATED LOGIC CIRCUIT MODULE

Kenneth W. Cohen, Chesterland, Ohio, assignor to Bailey Meter Company, Wickliffe, Ohio

Filed March 24, 1969, Ser. No. 809,763

Int. Cl. F15c *1/06*

U.S. Cl. 137—833 **1 Claim**



A fluidic circuit module formed from a pack or stack of plate elements having aligned apertures for fluid communication therethrough. Some of the apertures in the plate elements form inter-connecting fluid passages between the plate elements, at least one of the plate elements also has some of its apertures intra-connected by fluid passages for programming the pack and at least one of the plate elements has intra-connected fluid passages forming a plurality of radially extending active fluidic elements supplied from a centrally located power input aperture.

The double mode NOR gate, an active fluidic element which may be used in the module, includes an interaction chamber separating an aligned input and output passage defining a path of laminar fluid flow and a control fluid inlet passage opening into the interaction chamber for establishing a control stream fluid flow which switches the power stream from laminar to turbulent flow. The interaction chamber has side walls which diverge from the input passage in the direction of the output passage, and this causes the turbulent flow to attach to one of the side walls and reduces the outlet pressure to substantially zero.

3,731,701

SEPARATOR FOR FORCING FLUIDS BY PIPELINE

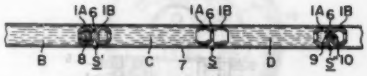
Koji Sugeno, Zama, Japan, assignor to Suzuei Co., Ltd., Tokyo, Japan

Filed July 2, 1971, Ser. No. 159,121

Claims priority, application Japan, July 25, 1970, 45/64779

Int. Cl. B08b *9/04*

U.S. Cl. 137—268 **8 Claims**



A separator for use in a pipe for separating different fluids within different axial sections of the pipe while enabling the different fluids to be simultaneously moved through the pipe. The separator includes a pair of substantially spherical hollow elastic bodies which are fixedly connected together by intermediate resiliently flexible wall means for permitting the bodies to deflect or bend relative to one another when passing through a curved pipe section. The spherical bodies each have an opening for providing communication between the pipe and the interior of the body whereby the fluid within the pipe deforms the elastic bodies into slideable sealing engagement with the internal wall of the pipe.

3,731,702

DEVICE FOR SUPPORTING THE VALVE BODIES OF TURBOMACHINES

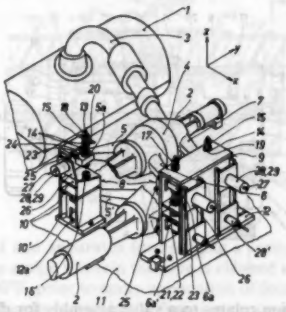
Hans Bellati, Wettingen, and Peter Pfenicher, Gebenstorf, both of Switzerland, assignors to Aktiengesellschaft Brown Boveri & Cie., Baden, Switzerland

Filed Feb. 29, 1972, Ser. No. 230,275

Claims priority, application Switzerland, March 2, 1971, 3051/71

Int. Cl. F16f *15/00*

U.S. Cl. 137—343 **4 Claims**



Apparatus for supporting the body of a valve for a turbomachine such as a steam turbine on its foundation which is so constructed as to permit displacement of the valve body in three different directions at right angles to each other as a result of stresses imposed upon it when in service. To this end, the valve body is provided with three laterally extending support arms, each arm being connected in a flexible manner with a rigid support frame anchored to the foundation which permits the three different directions of movement. In addition, the support frames are each provided with means by which the corresponding arms on the valve body can be adjusted under restraint in at least two different directions at right angles to each other during assembly and also during dismantling of the valve body when out of service.

3,731,703

SHUT-OFF FUEL TAP FOR MOTOR VEHICLES OR THE LIKE

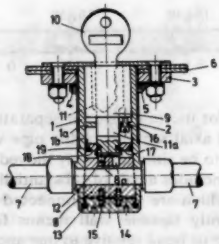
Aloys Hubenthal, Hirschbergstrasse 19, Munich, Germany

Filed May 10, 1971, Ser. No. 141,671

Claims priority, application Switzerland, May 13, 1970, 7076

Int. Cl. F16k *35/10*

U.S. Cl. 137—384.2 **9 Claims**



A shut-off fuel tap which has a fuel plug interposed in the fuel line and which plug can be turned by a key insertable in a lock cylinder. The fuel tap includes sealing means between the shut-off plug and the lock cylinder which prevents escape of vapors or the like from the fuel line. The shut-off plug can be easily removed by means of an end plug in the fuel tap assembly and thereby facilitates cleaning and repair of the shut-off plug.

3,731,704

RESERVE SWITCH FOR DIVING EQUIPMENT

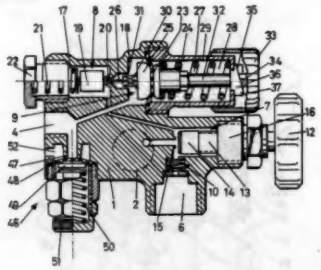
Hans Otto Lerris, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed April 7, 1971, Ser. No. 132,114

Claims priority, application Germany, April 16, 1970, P 20 18 147.9

Int. Cl. F16k *17/04*

U.S. Cl. 137—612.1 **7 Claims**



The invention relates to a valve assembly for diving equipment having an air inlet to which a container bottle containing pressurized air may be attached and an air outlet to which the breathing equipment is attachable. Between the air inlet and air outlet is reserve valve means which is biased in an opening direction by pressurized air on the downstream said thereof and in a closing direction by valve actuator means which operates to close the reducing valve when the air pressure on the downstream side drops to a predetermined minimum pressure. First and second guide means are provided for the valve actuator means which actuator means has a range of movement relative to each of said guide means with said movement being automatic relative to the first guide means and manually controllable relative to the second guide means, The valve actuator means is transferable from the first guide means to the second guide means only at a point corresponding substantially to said minimum pressure.

3,731,705

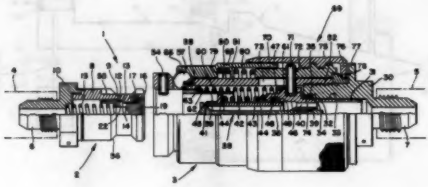
FLUID COUPLING

Joseph W. Butler, Elyria, Ohio, assignor to Lear-Siegler Inc., Maple Heights, Ohio

Filed May 6, 1970, Ser. No. 35,136

Int. Cl. F16l *29/00*

U.S. Cl. 137—614.06 **20 Claims**



Fluid coupling consists of two separable coupling parts each containing a valve for controlling fluid flow therethrough. A single locking device locks the coupling parts together, and the fluid coupling operations are interlocked to permit only one operation at a time in the correct sequence preventing opening of the valves prior to locking the coupling parts together and requiring closing of the valves and breaking of the intercoupling seal prior to unlocking.

3,731,706

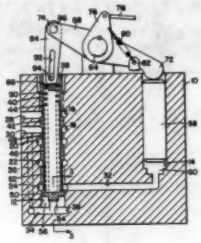
VALVE WITH HYDRAULIC LOCK

Richard Arlo Michael, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed March 30, 1972, Ser. No. 239,450

Int. Cl. F16k *31/44*

U.S. Cl. 137—624.27 **6 Claims**



A modulating valve is urged from its extreme closed position to its extreme open position by one end of a pivoted lever, and the modulating pressure is applied to a piston which acts on the other end of the pivoted lever to lock the modulating valve in its extreme open position until an external force is applied to the lever to move the modulating valve to its extreme closed position.

3,731,707

CONTROL VALVE FOR ELASTIC PRESSURE FLUID

Axel Gunnar Berle, Antwerpen; Lars Gunnar Nilsson, and Hans Kristoffer Olofsson, both of Wilrijk, all of Belgium, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

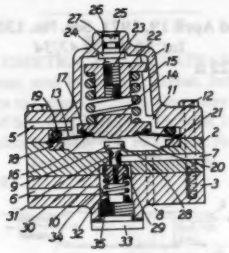
Filed July 7, 1970, Ser. No. 52,868

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.66 **5 Claims**

A control valve for elastic pressure fluid comprises a housing with inlet and outlet passages in which a valve member is movable from a first position in which pressure fluid is vented from one outlet passage to a second position in which pressure fluid is supplied to said outlet passage. A diaphragm formed as

a cup shaped resilient disc divides the housing in two chambers, one of which being constantly vented to the atmosphere and the other being supplied with pressure fluid of varying



pressure, the value of which causes the resilient disc to flex from a position in which the valve member is unaffected by the diaphragm to a position in which the valve member is moved from the one position to the other position.

3,731,708

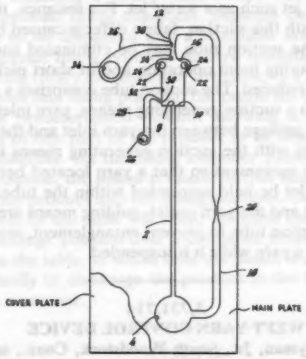
FLUIDIC DEVICE

Robert F. O'Keefe, Trumbell, and Basil B. Beeken, New Haven, both of Conn., assignors to Automatic Switch Co., Florham Park, N.J.

Filed Nov. 5, 1970, Ser. No. 87,132

Int. Cl. F15c *1/18*

U.S. Cl. 137—81.5 **8 Claims**



A device for isolating contaminated control signal fluids from fluidic control logic comprises a first emitter channel for directing a first laminar fluid jet through a vented interaction chamber for impact with a second fluid jet issuing through an orifice between the chamber and a second emitter channel. Control signal fluid is introduced into the chamber to render the first fluid jet turbulent and shift the jet impact plane from the vicinity of the orifice toward the opposite end of the chamber. The resultant reduction in fluid pressure in the second emitter channel is manifested at an output port communicating therewith.

3,731,709

LIQUID PULSATION DAMPENER

Robert C. Glover, Santa Paula, Calif., assignor to Fluid Kinetics Corporation, Ventura, Calif.

Filed June 1, 1971, Ser. No. 148,361

Int. Cl. F15d *1/06*

U.S. Cl. 138—37 **5 Claims**

A dampener is disclosed for use in a pipeline, to reduce noise, vibration and peak pressures. A housing receives intake and outlet manifold structures which impart an orbital spin flow pattern to the liquid causing it to move in a circle about the axis of the major flow pattern. The manifolds as disclosed are somewhat flat members defining radially-extending peripheral shoulders which are ported to communicate with

radially-extending passages through which fluid is communicated into and out of the orbital flow pattern. As disclosed herein, the housing is spherical with axially-aligned inlet and outlet ducts, and nozzles are provided in the ports of the inlet manifold.

3,731,710

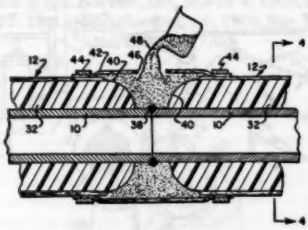
SPRAY FOAM INSULATED PIPE

Richard H. Bauer, West Caldwell, and Richard Kilpert, Berkeley Heights, both of N.J., assignors to Esso Research and Engineering Company

Division of Ser. No. 486,591, Aug. 27, 1965, Pat. No. 3,480,493, which is a continuation-in-part of Ser. No. 420,083, Dec. 21, 1964. This application March 1, 1971, Ser. No. 119,920

Int. Cl. F16l *9/14*

U.S. Cl. 138—143 **1 Claim**



A method and apparatus for applying a spray plastic foam insulation to a pipe wherein the pipe is cleaned and preheated to at least 90°F. prior to spray application of foam. The cleaning and preheating assist in the foaming process and enhance the physical bond of the initial layer of sprayed foam to the pipe. A bitumastic and kraft paper vapor-barrier subsequently is applied thereon to the exterior surface of the insulation.

3,731,711

CORRUGATED CONDUIT

William J. Bauer, 422 South Park, La Grange, Ill.

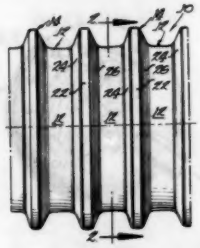
Filed Dec. 17, 1968, Ser. No. 784,355

Int. Cl. F16l *9/02, 9/06*; F17d *1/00*

U.S. Cl. 138—178 **11 Claims**

Corrugated metal conduit is provided with inwardly projecting corrugations having smoothly arcuate broad inner crest surfaces which are substantially broader than the intervening trough bottoms and which are inclined shallowly outward at each edge whereby the fluid flow conforms thereto and the

eddy volume in the troughs is minimized to increase the flow efficiency of the conduit. Further, inwardly extending projections may be provided on the crests to generate vortices to assist in delaying the departure of the flow from the crest surfaces.

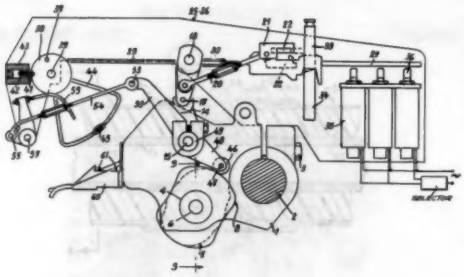


3,731,712

WEFT DISTRIBUTOR AND SELECTOR FOR POWER LOOMS

Jacques Sermet, Bourgoin-Jallieu, France, assignor to Ateliers Diederichs, Bourgoin-Jallieu, France

Filed July 6, 1971, Ser. No. 159,634
Int. Cl. D03d *47/38*
U.S. Cl. 139—122 W **3 Claims**



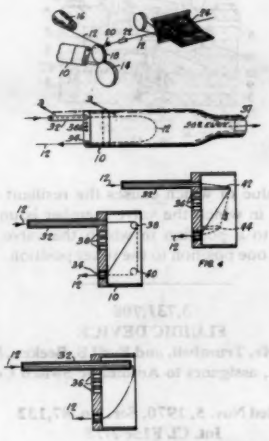
In a power loom a distributor-selector device for selecting multi-color wefts among a plurality of weft threads and presenting the selected weft thread to the insertion member. Each weft thread is engaged permanently in a guide independent of the guides receiving the other threads, all the guides being mounted in side by side relationship and adapted to oscillate about a common shaft, the oscillation of the selected guide resulting from the movement of a pull rod to which it is connected and which is adapted, when selected, to become locked to a blade to which a rectilinear reciprocating motion is imparted. The thread movement caused by the oscillation of its guide is completed by the downward pivotal movement of a fork bending said thread across the path of the insertion member. The selected pull rod is lifted by the thrust exerted directly against it by the core of an electromagnet so as to cause its locking engagement with said blade controlling the pull rod, this locking engagement being obtained by using a pivoted catch formed with a notch and responsive to a return spring.

3,731,713

WATER JET LOOM

J. P. Benoit Lachapelle, 26 Des Tilleuls, and Joseph Majorique LaBranche, 562A Brock, both of Drummondville, Quebec, Canada

Filed April 19, 1971, Ser. No. 135,261
Int. Cl. D03d *47/34*
U.S. Cl. 139—122 R **9 Claims**



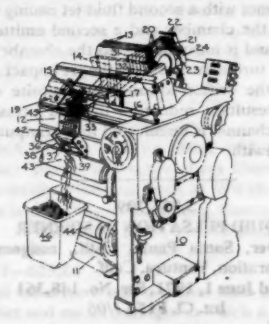
A suction tube to be used for the instant storage of yarn in a fluid jet loom and particularly between a yarn supply and a fluid feeding jet such as a water jet. For instance, it has been found that with this suction, fabric defects caused by gas turbulence in the suction tube may be eliminated and that the loom stops during loom operation and/or short picks may be substantially reduced. The suction tube comprises a portion to be adapted to a suction generating means, yarn inlet and yarn outlet. A gas passage between the yarn inlet and the yarn outlet cooperates with the suction generating means to provide sufficient gas movement so that a yarn located between said inlet and outlet be held suspended within the tube. Between the yarn inlet and the yarn outlet, guiding means are provided inside the suction tube to prevent entanglement, snarl or loop formation on a yarn while it is suspended.

3,731,714

WEFT YARN CONTROL DEVICE

Merton C. Lyman, Jr., South Woodstock, Conn., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1971, Ser. No. 183,536
Int. Cl. D03d *49/70*
U.S. Cl. 139—302 **5 Claims**



A device for shuttleless looms for receiving and gripping the ends of weft yarns extending from a shed of warp yarns into which they were inserted that permits advancement of the

gripped ends in the direction of movement of the fabric as it is formed and after severance of their connections to the edge of the fabric to strip from and dispose of the gripped ends held by the device.

3,731,715

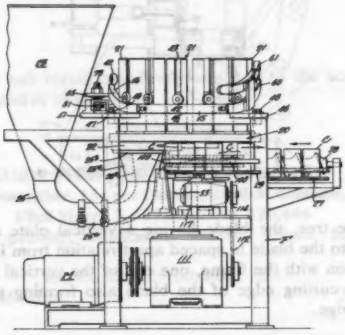
VOLUMETRIC FILLING APPARATUS

Louis M. Gageant, and William L. Greet, both of Cherry Hill, N.J., assignors to Campbell Soup Company, Camden, N.Y.

Continuation of Ser. No. 829,021, May 29, 1969, abandoned. This application July 19, 1971, Ser. No. 164,009

Int. Cl. B65h *1/04, 3/04*

U.S. Cl. 141—107 **10 Claims**



A multi-stage volumetric filler for a generally fluent food product including a rotary table which carries a series of piston-operated filling chambers. Separate components of a product to be dispensed into a container are fed upwardly from separate filling positions located beneath the rotary table. During rotary movement of the table, as a filling chamber passes over one filling position, the piston for that chamber is raised a predetermined amount allowing a predetermined quantity of one part of the product to be dispensed into the filling chamber. As the filling chamber passes over another filling position, the piston is raised further allowing the other part of the product into the filling chamber. Continued rotary movement of the table will cause the filled chamber to move to a discharge position over a container moving at the same speed as the table, at which time the piston is caused to move downwardly to discharge the product in the filling chamber into the container.

3,731,716

DRAWBACK SLEEVE SLIDE VALVE

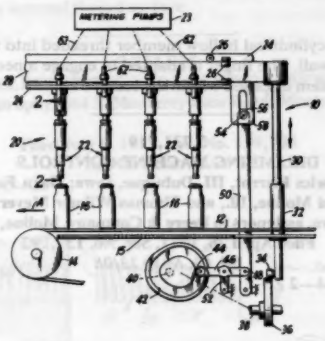
Joseph R. Darish, Plainfield, N.J., assignor to Cozzoli Machine Company, Plainfield, N.J.

Filed Jan. 22, 1971, Ser. No. 108,924

Int. Cl. B65b *3/04;* **B67c** *3/02*

U.S. Cl. 141—117 **3 Claims**

A drawback slide valve for liquid charging apparatus which delivers a measured quantity of liquid into a container. The drawback slide valve has a hollow spindle with two sections of different external diameters. The spindle has two lateral openings in the spindle which communicate with the bore or hollow interior of the spindle. The bore is closed by a plug between the lateral openings. The spindle is partially enclosed by a sleeve which is slidable on the spindle. The sleeve has different diameters at different portions thereof which mate with the different diameters of the two spindle sections. The sleeve also forms an annular chamber having a diameter exceeding that of the larger spindle section and extending between the lateral openings of the spindle. In a first position of the sleeve relative to the spindle, the annular chamber forms a passageway between the two lateral openings of the spindle to permit a flow of liquid through the spindle, and in a second position of the sleeve, the sleeve blocks the upper lateral opening to block the flow of liquid through the spindle. The upper or upstream lateral opening is located on the larger diameter section of the spindle so that when the sleeve is shifted toward the second position to block the upstream opening, the available volume of the chamber between the sleeve and the spindle expands to create a negative pressure therein. The volume of the chamber is increased because the sleeve chamber is moved more along the smaller diameter section of the spindle. With the diameter smaller, the chamber between the sleeve and the spindle increases in volume. The negative pressure due to the increasing volume and blocked entrance opening to the chamber functions to draw back liquid from the downstream lateral opening into the chamber and thereby prevent any drip from the valve after cut-off of the flow of liquid at the upstream lateral opening of the spindle.



3,731,717

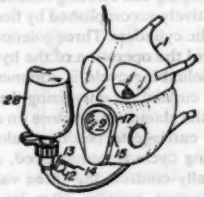
CANTEEN FOR USE WITH A GAS MASK

Norman Potash, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army

Division of Ser. No. 804,188, March 4, 1969, Pat. No. 3,635,217. This application Dec. 16, 1970, Ser. No. 98,514

Int. Cl. A62b *7/00*

U.S. Cl. 141—379 **1 Claim**



An improved protective mask means having a drinking and resuscitation connection means to permit drinking and resuscitation while wearing the mask in a contaminated atmosphere.

3,731,718

ADAPTER CONNECTOR

Harry A. Gramig, Culver City, Calif., assignor to Springer Company, Inc.

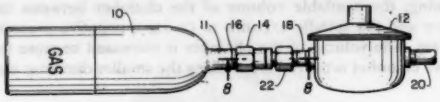
Filed March 3, 1971, Ser. No. 120,488

Int. Cl. B65b *1/04;* **B65l** *3/04;* **B67c** *3/00*

U.S. Cl. 141—384 **8 Claims**

Herein described is an adapter connector for use in connecting a reserve gas supply into a gas system. The connector includes a hollow chamber being threaded on both ends. One end of the chamber is adapted to engage the spud nut on a pressure regulator in the gas system. The other end of the

chamber is adapted to directly engage the reserve tank cylinder. A wall partitions the chamber and has a threaded opening therein to receive a protruding valve engaging finger



which is a cylindrical hollow member threaded into the opening in the wall. The finger is adapted to engage a needle valve in a valve stem disposed within the reserve tank.

3,731,719

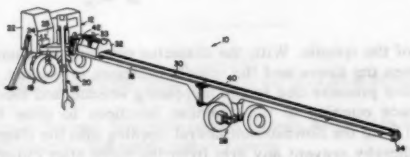
DELIMBING MACHINE CONTROLS

Victor Charles Pierrot, III, Dubuque, Iowa; Garn Farley Penfold, East Moline, Ill., and Thomas Wilmer Meyers, Davenport, Iowa, assignors to Deere & Company, Moline, Ill.

Filed April 26, 1971, Ser. No. 137,192

Int. Cl. A01g *23/08*

U.S. Cl. 144—2 Z **3 Claims**



A delimbing machine includes an elongate horizontal platform having a track along which a knife carriage is driven. The knives on the carriage are openable and closable for respectively receiving and encircling a tree stem to be delimbed. Mounted adjacent one end of the track is a retainer-ejector including a clamp arm swingably mounted on a swingable bed for selectively holding tree stems on the bed when the latter is in a delimbing position over the platform and for releasing the delimbed tree stems to one side of the platform when the bed in in a tree-eject position at one side of the platform. A boom-mounted grapple is operable for positioning a tree stem on the platform and in the open clamp and delimbing knives. The delimbing knife carriage drive includes a reversible hydraulic motor and the clamping and ejecting functions of the retainer-ejector are respectively accomplished by first and second double-acting hydraulic cylinders. Three solenoid-operated valves respectively control the operation of the hydraulic motor and cylinders and a delimbing cycle is commenced by manually switching electric current for energizing the appropriate solenoids for causing the clamp arm to close on a tree stem and for causing the knife carriage to be driven along the tree stem. Once the delimbing cycle is commenced, an electrical logic circuit automatically controls the three valves to return the carriage to its starting position after its delimbing run is finished and to eject the delimbed tree and return the retainer-ejector clamp arm and bed to respective conditions for receiving the next tree stem to be delimbed. An override circuit is provided to permit the control of the valve solenoids by manually-actuated switches.

3,731,720

SHEAR ASSEMBLY FOR TREE HARVESTERS

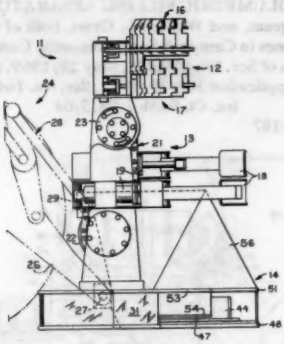
Raymond L. Moser, Tremont, and Edward J. Moyer, Morton, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 27, 1970, Ser. No. 58,466

Int. Cl. A01g *23/08*

U.S. Cl. 144—3 D **9 Claims**

A tree harvester including a mechanism for gripping and axially moving the tree, a shear assembly and a delimbing assembly, the shear assembly having an outwardly facing anvil secured to a frame, a rigid jaw and a pivotal blade extending outwardly from the frame on opposite sides of the anvil to form an outwardly facing opening for receiving a standing tree and a jack for pivoting the blade toward the jaw and anvil to



sever the tree, the blade having a vertical plate arcuately secured to the blade in spaced apart relation from its pivotal connection with the frame, one end of the vertical plate adjacent a cutting edge of the blade also forming a vertical cutting edge.

3,731,721

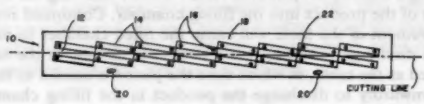
WEDGE-CUTTING MACHINE INCLUDING TEMPLATE AND HOLD-DOWN

Albert W. Reese, RT. No. 2, Box 36 0A, Hampstead, Md.

Filed Sept. 15, 1970, Ser. No. 72,378

Int. Cl. B27b *25/10*

U.S. Cl. 143—51 A **4 Claims**



A wedge-cutting machine including a sliding wedge template having a base affixed with a series of diagonally staggered uprights forming a series of diagonally staggered wedge blank receiving slots longitudinally connected by a straight sawcut, and a co-acting combination hold-down and fence having cantilevered top for receiving therebeneath and guiding the wedge template, all disclosed in the context of use in combination with an overhead saw. A series-connected rubber-base template is described.

3,731,722

KEEPER ACCESSORY FOR VARIOUS TYPES OF CONVENTIONAL TOOLS

Harry A. Carr, 2934 El Caminito, La Crescenta, Calif.

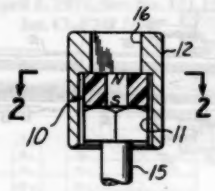
Filed Oct. 8, 1971, Ser. No. 187,685

Int. Cl. B25b *15/00*

U.S. Cl. 145—50 DA **19 Claims**

A keeper accessory for use on typical, conventional tools of assorted types and sizes including socket, box, end wrenches, screw drivers, pliers, etc. The magnetic accessory is held in its normal operating position without need for alteration in the tool or interference with its use with the size of fastener for

which the tool was designed and relying on either an interference fit with a surface of the tool or finger pressure applied



to wrap a soft metal tang firmly attached to the accessory about the tool or its handle.

3,731,723

GUIDE STRIP AND NAIL COMBINATION

Francis Lemanchec, 134 rue Danton, Rueil-Malmaison, France

Filed March 3, 1971, Ser. No. 120,446

Claims priority, application France, March 5, 1970, 7007902

Int. Cl. B25b *29/00;* **E04c** *1/34*

U.S. Cl. 145—129 **3 Claims**

This guide is for driving bullen-nails. It consists of plastic material such as polyethylene, and comprises a plurality of aligned and spaced disks having a flat bottom face and an upper surface adapted to fit with more or less clearance into the lower hollow head of a bullen-nail, said disks being each formed with an axial through hole of a diameter slightly inferior to that of the nail point, said disks being furthermore interconnected at their bases by relatively thin, short and narrow lugs of such length that the distance between any pair of adjacent holes corresponds substantially to the diameter of the nail heads.

3,731,724

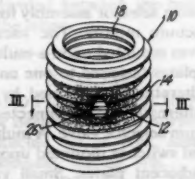
SELF-LOCKING THREADED INSERT

Max F. Dorflinger, Huntington Beach, Calif., assignor to U & M Corporation, Boston, Mass.

Filed July 30, 1971, Ser. No. 167,689

Int. Cl. F16b *39/34*

U.S. Cl. 151—7 **8 Claims**



A self-locking threaded sleeve insert having an external screw thread and an internal screw thread, an aperture through a wall of the sleeve intermediate its ends, a body of normally hard tough resilient resin strongly adherent to the external thread surface in surface portions adjacent to the aperture and a body of normally hard tough resilient resin strongly adherent to the surface of the internal thread. The two bodies of resin may be formed by heating the sleeve and directing a stream of resin particles against the heated surface of the sleeve to deposit resin on the external thread surface adjacent the aperture and to pass through the aperture and deposit resin on the internal thread surface.

3,731,725

SELF STOPPING AND LOCKING SCREW

Alfred H. Brophy, 564 S. Monterey Pass Road, Monterey Park, Calif.

Filed July 6, 1971, Ser. No. 159,785

Int. Cl. F16b *39/30*

U.S. Cl. 151—22 **1 Claim**

A self locking screw fastener comprising an elongate shank with front and rear ends and a tool engaging head, at the rear end of the shank, said shank having axially spaced front and rear threads roll formed thereon and a straight, cylindrical forming portion intermediate the threads, the front thread having a tapered female thread forming rear end portion diminishing circumferentially and rearwardly in the forward part of the forming portion and the rear thread having a tapered female thread forming front end portion diminishing circumferentially and forwardly in the rear part of the forming portion.

3,731,726

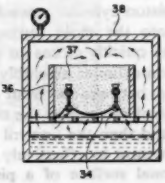
METHOD OF CASTING BIMETALLIC JEWELLERY

Otto Eugen Eberle, 421 Guildway Parkway, West Hill, Ontario, Canada

Filed June 28, 1971, Ser. No. 157,269

Int. Cl. B22c *9/04;* **B22d** *25/02*

U.S. Cl. 164—7 **9 Claims**



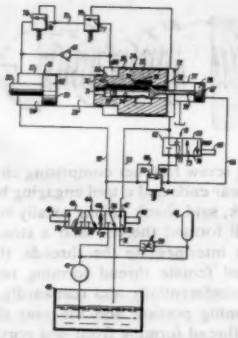
A method of casting jewellery of bimetallic construction, in which a first metallic part is embedded in a wax model of the second part and the combined metal part and wax model is then immersed in liquid investment, which investment is then allowed to harden in the conventional manner. The investment is then subjected to moderate heating, sufficient to melt the wax and cause the wax to run out of the cavities in the investment, but being insufficient to affect the finish on the metallic first part within the investment. A wax solvent then removes the last traces of wax and the investment is then placed in an oven and heated for an extended period at a moderate temperature, again being controlled so as to be insufficient to in any way affect the finish or form of the first metal part which remains trapped within the investment. The second metal in a molten state, is then poured into the cavities in the investment in such a way as to ensure rapid and

complete filling of the cavities. The molten second metal then envelops portions of the first metal part exposed within the cavity, and after hardening, the first and second metal parts are securely fastened together without any requirement for further soldering or other fastening.

3,731,727
PRESSURE INTENSIFYING APPARATUS FOR A DIE CASTING MACHINE

Mitsuru Mitamura, and Mamoru Ozeki, both of Yokohama, Japan, assignors to Toshiba Machine Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1971, Ser. No. 213,629
Claims priority, application Japan, Dec. 29, 1970, 45/130288
Int. Cl. B22d *17/32*; B22c *19/04*
U.S. Cl. 164—154 **9 Claims**



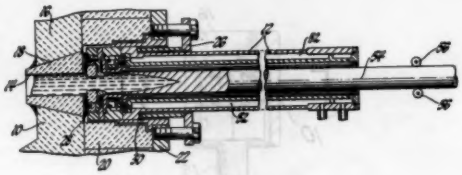
A die casting machine for casting a molten metal in a mold includes a first piston-cylinder assembly which is operative to cause the molten metal to flow rapidly into the mold and a second piston-cylinder assembly which operates to apply an intensified fluid pressure on a piston surface of the first piston-cylinder assembly when the mold has been filled with the molten metal. The operation of both the first and second piston-cylinder assemblies may be selectively achieved by means of a control valve. The control valve has a piston located in a pressurized working fluid for causing the working fluid to move freely into the first piston-cylinder assembly to pour the molten metal rapidly into the mold during an initial casting process, but the same quickly closes an inlet of the working fluid to the first piston-cylinder assembly when a static pressure difference occurs between the front and rear surfaces of the piston of the control valve upon the mold becoming filled with molten metal, and then the control valve piston causes the working fluid pressure to effectively and quickly be applied on the functional surface of a piston of the second piston-cylinder assembly to generate the intensified pressure to be applied to the molten metal for making a uniform composition.

3,731,728
MOLD APPARATUS FOR CONTINUOUS CASTING

Fred J. Webbere, Orchard Lake, and Robert G. Williams, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 827,747, May 26, 1969, abandoned. This application Sept. 27, 1971, Ser. No. 184,297
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **6 Claims**

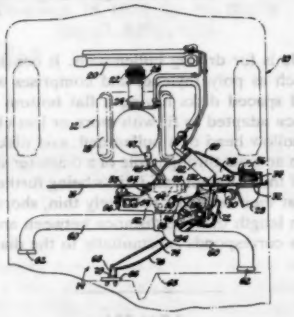
Apparatus for continuous casting including an open-ended mold with a first portion adjacent the inlet end having a low heat transfer capacity where no significant solidification of metal takes place, a second portion adjacent the first portion adapted to effect initial skin layer solidification and a third portion adjacent the second portion where progressive solidification is accomplished to form solid bar stock.



3,731,729
SELECTOR/PROGRAMMER ASSEMBLY FOR AUTOMATIC TEMPERATURE CONTROL

Paul K. Beatenbough, Medina; Lewis E. Dresch, North Tonawanda; Ward H. Hutchins, Lockport, and Walter W. Weiss, Tonawanda, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 7, 1972, Ser. No. 223,904
Int. Cl. B60h *1/02*
U.S. Cl. 165—16 **4 Claims**

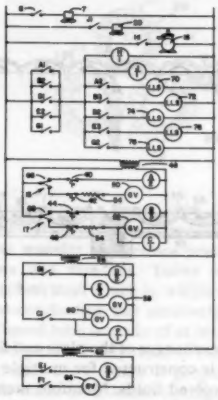


An automatic temperature control system for heating and cooling an automobile passenger compartment including temperature responsive means for positioning a heat regulating member, damper means in passages for directing air into the passenger compartment through alternate outlets, vacuum motors for moving said dampers between operative positions and an integral vacuum selector assembly for routing vacuum pressure to the vacuum motors. The vacuum selector assembly includes valves mounted upon a multilayered member formed of parallel plates fastened to one another and having vacuum passages therebetween formed by channels in the plates which are alternately interconnected in response to rotation of the vacuum selector valve. A multi-speed blower is controlled by several switches mounted upon a base which is spaced from the adjacent plates. Small vacuum actuators formed on one of the plates operate the electric switches to effect changes in the blower speed in response to rotation of the selector valves.

3,731,730
MODULAR MULTIZONE, ZONE LOGIC CONTROL CENTER

George G. Callahan, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed April 5, 1971, Ser. No. 131,153
Int. Cl. F24f 3/00
U.S. Cl. 165—22 3 Claims

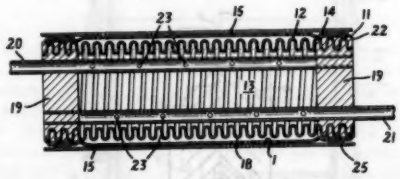


A control system for utilizing a single, low voltage thermostat to actuate a plurality of heating means or a plurality of cooling means.

3,731,731
TEMPERATURE CONTROL MEANS FOR BLOOD AND THE LIKE FLUIDS

Erik Bach Kyvsgaard, Charlottenlund, and Christian Peter Simonsgaard, Holte, both of Denmark, assignors to Polystan ved F. Kyusgaard, Herlev, Denmark

Filed May 4, 1971, Ser. No. 140,118
Int. Cl. F28f 7/00
U.S. Cl. 165—46 7 Claims



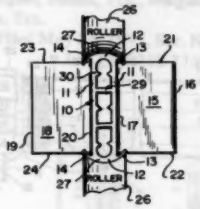
The invention relates to a device for adjusting the temperature of blood and the like fluids under sterile conditions, comprising a reservoir in the shape of a collapsible bag, in which the fluid is contacted with the outer surface of a temperature adjusting body through which a temperature adjusting medium flows, said temperature adjusting body comprising a substantially tubular rigid body passing through the collapsible bag in the assembly plane of the latter below the fluid inlet, a tight joint being provided between the bag and the tubular body at the ends of the latter.

3,731,732
TUBE AND FIN HEAT EXCHANGER

Russell C. Awe, New Berlin; James C. Burton, and Thomas G. Blank, both of Racine, all of Wis., assignors to Modine Manufacturing Company, Racine, Wis.

Filed May 3, 1971, Ser. No. 139,737
Int. Cl. F28f 1/20
U.S. Cl. 165—181 5 Claims

A tube and fin heat exchanger and method of making in which a tube includes a pair of spaced apart flanges projecting outwardly from one side of the tube and a serpentine fin having coplanar crests on one side of the fin is in contact with the tube side between the flanges and with the opposite edges of the fin located between and against the flanges and the flanges being distorted toward each other thereby comprising means for securing the fin opposite edges to lock the fin in position

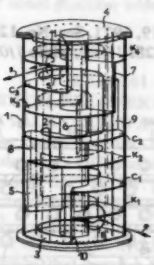


with the fin crests at the one side of the fin against the tube side preparatory to permanent bonding as by brazing. In the method the fin crests are located against the side of the tube and the opposite flanges on that side are then distorted toward each other to grasp securely the opposite edges of the serpentine fin.

3,731,733
TUBE-GROUP HEAT EXCHANGERS

Georges Trepaud, 1 Rond Point Bugeaud, Paris, France

Filed June 1, 1971, Ser. No. 148,677
Int. Cl. F28f 9/22
U.S. Cl. 165—161 3 Claims

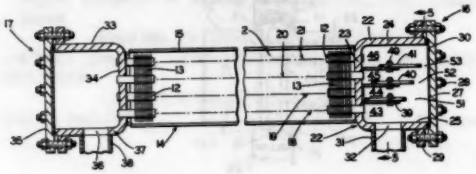


A cylindrical enclosure is provided with a central tubular nucleus and in between these, a first fluid flows following at least two parallel overlapping pseudo-helical paths which entirely occupy the volume between the enclosure and the nucleus. The paths are guided by vertical radial partitions and horizontal baffles. The baffles are interconnected by the radial partitions in twos (helical double-flow baffling) or in threes (helical triple-flow baffling) and have segmented cut-outs staggered in succession relative to one another. Also provided in the space between the enclosure and the nucleus and working in combination with the flow paths is a series of parallel tubes in which a second fluid flows, said tubes passing through the baffles. This exchanger allows not only a higher thermal performance as a result of better guidance of the fluid and at the same time a higher out-put, but also a considerable mechanical improvement by reduction of the range of the tubes of the tube-groups.

3,731,734
ADJUSTABLE SELECTIVE ORIFICING STEAM CONDENSER

Kenneth B. Ris, Massillon, and Ferdinand V. Huber, Canton, both of Ohio, assignors to Ecodyne Corporation, Chicago, Ill.

Filed May 3, 1971, Ser. No. 139,371
Int. Cl. F28f 13/00; F28b 1/06
U.S. Cl. 165—100 5 Claims

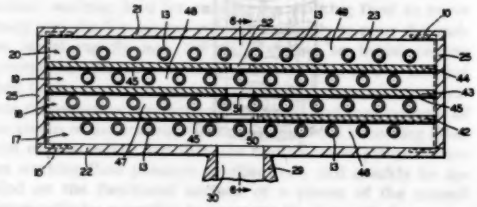


An air cooled steam condenser having adjustable plate means or a series of adjustable plates mounted within the steam intake header compartment. The plate means in effect form a series of interconnected subchambers, each of which communicates with a row of cooling tubes in which steam is condensed by a stream of cooling air flowing over, around and past the tubes. The rows of tubes extend transversely of the direction of airflow and the rows extend perpendicular to the direction of airflow at spaced intervals. An adjustable inlet passage is formed by each plate through which steam flows into the subchambers. The passages are smaller in area for each successive subchamber in the header through which the steam flows so that only that amount of steam that can be condensed effectively within the tubes in any row, enters such row, having regard to the tube length and the temperature difference at the particular row which determines the cooling effect of the airflow over the successive rows of tubes.

3,731,735
SELECTIVE ORIFICING STEAM CONDENSER

Kenneth B. Ris, Massillon, Ohio, assignor to Ecodyne Corporation, Chicago, Ill.

Filed March 19, 1971, Ser. No. 126,174
Int. Cl. F28f 13/00; F28b 1/06
U.S. Cl. 165—110 2 Claims

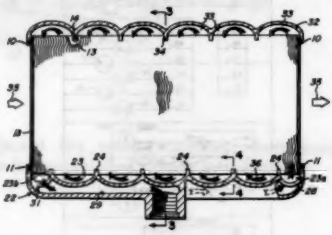


An air cooled steam condenser having plate means or a series of plates mounted within the steam intake header compartment. The plate means in effect form a series of interconnected subchambers, each of which communicates with a row of cooling tubes in which steam is condensed by a stream of cooling air flowing over, around and past the tubes. The rows of tubes extend transversely of the direction of airflow and the rows extend perpendicular to the direction of airflow at spaced intervals. An opening is formed in each plate through which steam flows between sub-chambers. The openings are smaller in area in successive plates in the header through which the steam flows so that only that amount of steam that can be condensed effectively within the tubes in any row, enters such row, having regard to the tube length and the temperature difference at the particular row which determines the cooling effect of the airflow over the successive rows of tubes.

3,731,736
PLATE AND FIN HEAT EXCHANGER

Joseph F. Fernandes, Centerville, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed June 7, 1971, Ser. No. 150,547
Int. Cl. F28f 3/00
U.S. Cl. 165—166 5 Claims

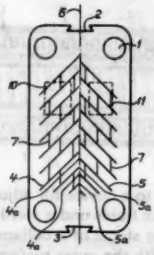


A compact heat exchanger of the plate and fin type in which a manifolded core is constructed for multiple pass flow of at least one of the involved fluids. Manifold members have ribs achieving localized crushing engagement with the fin material providing for separation of adjacent flow passes without the use of dividing channel and like separable component parts.

3,731,737
PLATE HEAT EXCHANGER

Sverre Knut Jenssen, 133000 Saltsjobaden, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed March 10, 1969, Ser. No. 805,699
Claims priority, application Sweden, March 12, 1968, 3238/68
Int. Cl. F28b 3/08
U.S. Cl. 165—167 4 Claims



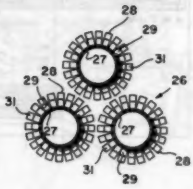
A plurality of identical heat exchange plates have respective heat exchange surfaces provided with protuberances acting as turbulence-effecting and spacing means between adjacent plates, such plates being adapted for assembly with marginal gaskets to form plate interspaces for throughflow of two heat exchange media along said surfaces at opposite sides (faces), respectively, of each plate. The plate interspaces are of the same depth, and at least one plate is turned 180° relative to the other plates around an axis extending in the plane of the turned plate, the protuberances of each plate being arranged unsymmetrically and so disposed that two different kinds of plate interspaces are formed by such turning of said one plate, thereby creating different flow conditions for the heat exchange media.

3,731,738

TUBE FINS OF OUTWARDLY-ORGANIZED MATERIALS

Herbert Wyane Cooper, 17 St. Lawrence Place, Jericho, N.Y.

Filed July 26, 1971, Ser. No. 165,945
Int. Cl. F28f 21/02
U.S. Cl. 165—180 7 Claims



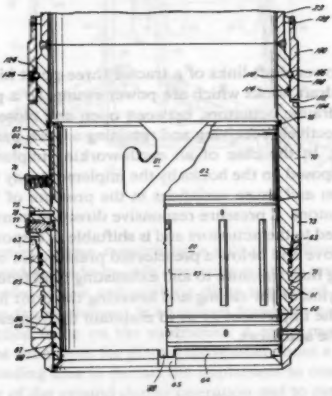
This disclosure teaches a finned tube (or studded tube or the like) for convection sections of process heaters or boilers to improve heat transfer and reduce pressure drops of both process streams and flue gas. Tubes in this service are preferably of carbon steel which is, within this context, a relatively-high heat-conducting but relatively-low heat-resisting material. The finned tube is made of at least two materials organized proximally and distally relative the tube wall to which it is connected and from which it projects outwardly. The distal portion is made of a relatively-high heat-resisting but relatively-low heat-conducting material such as stainless steel. The proximal portion may be of a material the same as that of the tube wall or it may be of a material with heat-conducting and heat-resisting properties intermediate those of the tube wall and of the distal portion.

3,731,739

WASH OUT METHOD AND APPARATUS

David P. Herd, Houston, Tex., assignor to Rockwell Manufacturing Company, Houston, Tex.

Filed Nov. 9, 1970, Ser. No. 87,783
Int. Cl. E21b 7/12, 43/01
U.S. Cl. 166—.5 38 Claims



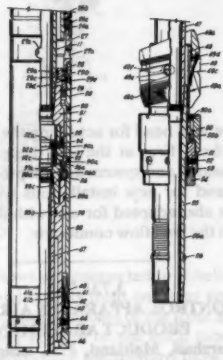
Method and apparatus for removing underwater well pipe connected below the mudline by washing out mud surrounding a portion of the pipe. The method utilizes a special joint which comprises two tubular members engageable with each other, one of which has wash out ports through its walls. A sleeve member is mounted in the tubular members for longitudinal movement from a first position where it blocks flow through the wash out ports to a second position where it permits such flow. The sleeve member when in the first position also locks the tubular members against disengagement but allows their disengagement when in the second position. The upper tubular member is rotatably mounted in an external casing which shields the upper tubular member from the mud whereby it can be turned to disengage it from the lower tubular member.

3,731,740

FLOATING PISTON FOR SELECTIVE HYDRAULIC PACKER

Bobby L. Douglas, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 24, 1971, Ser. No. 146,027
Int. Cl. E21b 23/04
U.S. Cl. 166—120 12 Claims



A well packer of the type which is set by hydraulic pressure injected through the tubing string, having a setting chamber between the pistons therein which actuate the packer, wherein one of the pistons is floating while the packer is being lowered to compensate for thermal expansion or contraction and pressure differentials encountered as the packer is lowered in the well in order to prevent undue pressure from being applied to the pistons which could cause the shearing of shear pins holding the packer in unset position which would prematurely set the packer.

3,731,741

SECONDARY OIL RECOVERY PROCESS USING OXYALKYLATED ADDITIVES

Harold A. Palmer, and Thomas E. Sample, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed July 6, 1971, Ser. No. 160,142
Int. Cl. E21b 43/22, 43/24
U.S. Cl. 166—272 10 Claims

A process for the recovery of hydrocarbon materials from a subterranean hydrocarbon-bearing formation by contacting the formation with an aqueous alkaline flooding medium containing a solubilizing agent.

ERRATUM

For Class 166—304 see:
Patent No. 3,732,166

3,731,742

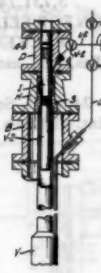
WELL FLOW CONTROLLING METHOD, APPARATUS AND SYSTEM

Phillip S. Sizer, and Albert W. Carroll, both of Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed March 17, 1971, Ser. No. 125,173
Int. Cl. E21b 43/00
U.S. Cl. 166—315 24 Claims

A method, apparatus, and system for controlling flow of well fluids from a well in response to sensing of a leak in the connections between the components of the well head or fire

at the well head for closing off all flow from the well upon the occurrence of such condition. Encompassed is modification of existing installations to carry out the method with a minimum of added equipment or well work-over. Sensing mechanisms responsive to leakage between adjacent connected components of the well head for actuating the closure and responsive to heat from fires at the well head are disclosed. The method, apparatus and system are adapted for multiple string installations and for new installations without modification. The system is also adapted for use with down-hole flow control devices in the well flow conductor.



3,731,743

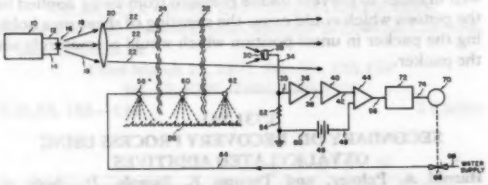
FIRE CONTROL APPARATUS AIR POLLUTION PRODUCT ABATEMENT

Albert H. Marshall, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1971, Ser. No. 191,096

Int. Cl. B06b *3/00*

U.S. Cl. 169—2 R **10 Claims**



A light source such as a gallium arsenide laser is positioned in relation to light detector means to produce an electrical signal modulated by the pollution product of an oil fire and applied to a control valve responsive to said modulated electrical signal to control the operation of water spray equipment directed on said fire to thereby minimize air pollution product of said fire.

3,731,744

APPARATUS FOR REGULATING THE DEPTH OF PENETRATION OF A PLOUGH

Johann Lipinski, 1030 Vienna, Austria, assignor to Alex Friedmann, Vienna, Austria

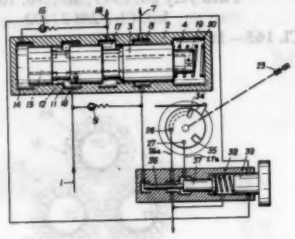
Filed Dec. 21, 1971, Ser. No. 210,361

Claims priority, application Austria, Dec. 23, 1970, A 11624/70

Int. Cl. A01b *63/112*

U.S. Cl. 172—7 **6 Claims**

An apparatus for regulating the depth of penetration of a plow which is drawn by a tractor and lifted or lowered by a hydraulic piston-cylinder arrangement. The depth of penetration of the plow is regulated by controlling the pressure in the working chamber of the lifting cylinder.



3,731,745

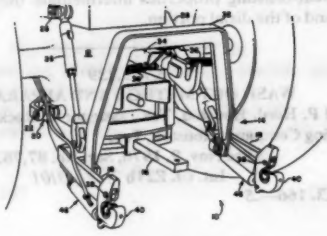
COMBINED DRAFT HOOK OPERATING AND DRAFT SENSING

James Allen Koch, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 1, 1972, Ser. No. 222,557

Int. Cl. A01b *63/112*

U.S. Cl. 172—7 **19 Claims**



The lower draft links of a tractor three-point hitch include pivotal draft hooks which are power swung, by a pair of one-way hydraulic actuators, between open and closed positions for respectively receiving and retaining a hitch part of an implement. In the case of an earth-working implement, draft loads imposed on the hooks by the implement may vary during operation and cause variations in the pressure of the fluid in the actuators. A pressure responsive direction control valve is connected to the actuators and is shiftable in response to pressures above and below a preselected pressure for respectively directing fluid pressure to and exhausting fluid from a hydraulic lift cylinder for raising and lowering the draft links for adjusting the implement so as to maintain the preselected pressure in the actuators.

3,731,746

WEIGHT TRANSFER HITCH

Maynard E. Walberg, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

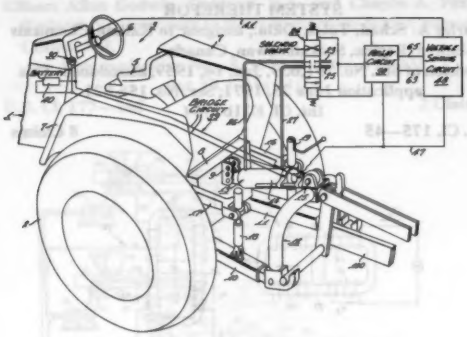
Filed Nov. 18, 1971, Ser. No. 199,943

Int. Cl. A01b *63/12*

U.S. Cl. 172—9 **10 Claims**

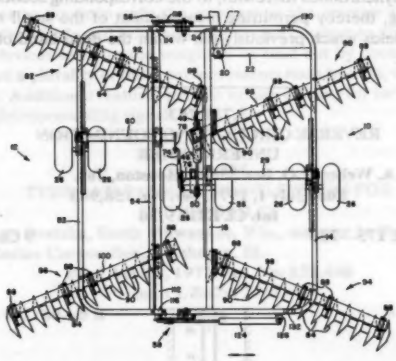
An electrically controlled hydraulic cylinder having a variable resistor and a bridge circuit for preselecting the desired

length of a remote hydraulic cylinder in the hydraulic system



of a tractor.

3,731,747
DISK HARROW
William Rudolph Frank, Moline, Ill., assignor to Deere & Company, Moline, Ill.
Filed Nov. 1, 1971, Ser. No. 194,640
Int. Cl. A01b *49/00*
U.S. Cl. 172—311 11 Claims

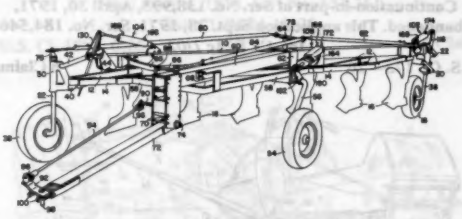


An implement frame comprising a pair of subframes normally disposed in a side-by-side operating position and having a plurality of concave soil-working disks supported thereon operative as the implement is advanced forwardly to exert a lateral reaction force on the subframes. A pivot mechanism connects the subframes for pivotal movement about a longitudinally extending axis to permit the implement to conform to the contour of the ground during operation and to permit one of the subframes to be swung to a position above the other, thereby substantially reducing the width of the implement for transport. The mechanism connecting the subframes is constructed in such a manner that the pivot axis moves upwardly as the subframes are moved from their operating to their transport position, the axis being at a relatively low point during operation to resist the tendency of the soil reaction force acting on the disks to raise the center of the implement, and at a relatively high point during conversion of the implement from its operating to its transport position to permit the subframes to assume the latter position.

3,731,748
MULTIPLE PLOW HITCH
James Franklin Sullivan, East Moline, and Loren Glenn Arnold, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed Feb. 23, 1971, Ser. No. 118,017
Int. Cl. A01b *49/00*
U.S. Cl. 172—314 13 Claims

A pair of drawn plows are connected in echelon by an elongated hitch tube which has its front and rear ends connected to the forward ends of the drawbars of the front and rear plows respectively. The rear portion of the hitch tube is also connected to the rear portion of the forward plow by a laterally extending parallel linkage and is raised and lowered relative to the frame of the front plow by an extensible and retractable hydraulic cylinder which is connected in series with an extensible and retractable hydraulic cylinder for raising and lowering the frame of the front plow on its rear furrow wheel. This structure provides a constant hitch height for the rear plows.

3,731,749
TOWED PLOW
James Franklin Sullivan, East Moline, and Loren Glenn Arnold, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed Feb. 23, 1971, Ser. No. 117,951
Int. Cl. A01b *63/16*
U.S. Cl. 172—401 9 Claims



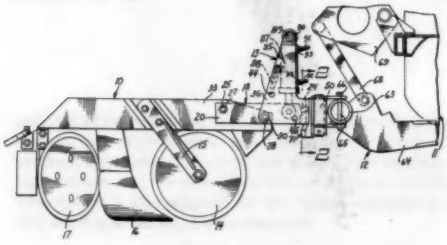
The frame of a gang plow is supported on front and rear furrow wheels and a land wheel, and is raised and lowered on the wheels by double-acting extensible and retractable hydraulic cylinders which are connected in series with the hydraulic cylinder for the land wheel being first in the series when raising. Stops are provided to determine the plowing position of the frame with respect to the furrow wheels and the hydraulic cylinders for the furrow wheels have lost-motion connections with the frame which permit limited additional retraction of the hydraulic cylinders after the frame has been lowered on the furrow wheels to the position determined by the stops. With this construction, the proper plowing position for the

frame with respect to the furrow wheels is determined by the stops and the plowing depth is determined by the amount of retraction of the cylinder for the land wheel. The hydraulic cylinder for the land wheel is also provided with an adjustable stop which prevents retraction of the hydraulic cylinder beyond a preselected position so that the plow will assume the same plowing depth each time it is lowered.

3,731,750
PLOW HITCH

James W. Brazell, Atlanta, Ga., assignor to Heath International, Inc., Richmond, Mich.

Filed Feb. 16, 1971, Ser. No. 115,497
Int. Cl. A01b *63/00*
U.S. Cl. 178—457 **3 Claims**

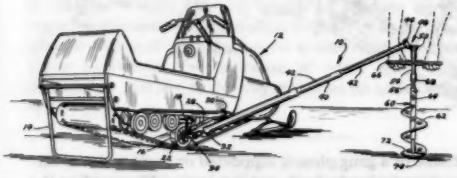


A plow hit for attaching a plow to a tractor or the like and which includes a means for centering the plow when it is raised to the transport position. The hitch includes a swivel attachment member for attaching the plow hitch to a hitch means on a powered vehicle, a swivel arm hingedly mounted at the front end on the swivel attachment vertical axis, a pivot assembly for attachment to a plow and which is pivotally mounted to the rear of the swivel arm about a horizontal pivot axis, power means carried by the swivel arm and connected to the pivot assembly for pivoting the plow about said horizontal pivot axis between lowered and raised positions, and means on the swivel attachment member and pivot assembly for limiting the horizontal swinging movement of the plow when it is in the lowered position, and for maintaining the plow in a centered position when the plow is in a raised position.

3,731,751
POWER DRIVEN AUGER ATTACHMENT FOR SNOWMOBILES

Harvey H. Rusco, P.O. Box 345, Schroeder, Minn.

Continuation-in-part of Ser. No. 138,993, April 30, 1971, abandoned. This application Sept. 28, 1971, Ser. No. 184,546
Int. Cl. E21c *1/02*
U.S. Cl. 173—26 **6 Claims**

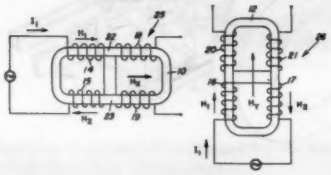


An ice auger is driven from the power train of a snowmobile through the instrumentality of an auger drive wheel which is rotatably mounted in a drive wheel mounting bracket and forced down against the inside of the bottom run of the snowmobile drive track. The drive between the drive wheel and the auger is accomplished using two universal joints with a telescoping drive shaft in between them. The mounting bracket pivots off of the underside of the snowmobile to force the drive wheel against the drive track and is held in place by an integral tensioning arm fastened to the snowmobile frame.

3,731,752
MAGNETIC DETECTION AND MAGNETOMETER SYSTEM THEREFOR

Charles A. Schad, Tulsa, Okla., assignor to Kalium Chemicals Limited, Regina, Saskatchewan, Canada

Division of Ser. No. 791,039, Jan. 14, 1969, abandoned. This application June 25, 1971, Ser. No. 156,821
Int. Cl. E21b *7/04*
U.S. Cl. 175—45 **8 Claims**

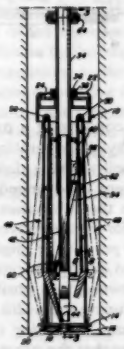


A highly sensitive magnetometer, consisting of at least one pair of generally rectangular core elements having square hysteresis loops, for use in a guidance system for off-vertical drilling, is disclosed. The primary windings of each of the cores are driven by an oscillator, with the secondary windings of each core being differentially connected through a null circuit, which serves to balance the effects of background fields, and a detector to a suitable indicator. The primary windings of the cores are operated in resonance and the secondary windings are arranged to provide a high null output which eliminates the dead band caused by the threshold value of the diodes in the output detector circuit. This high null output may be accomplished by unbalancing the core windings or by feeding a portion of the primary winding drive current, or a signal synchronous therewith, to the corresponding secondary winding, thereby permitting measurement of the small magnetic fields which previously fell within the dead band of the device.

3,731,753
REVERSE CIRCULATING FOUNDATION UNDERREAMER

Alman A. Weber, P.O. Box 35564, Houston, Tex.

Filed July 1, 1971, Ser. No. 158,943
Int. Cl. E21b *9/26*
U.S. Cl. 175—285 **9 Claims**



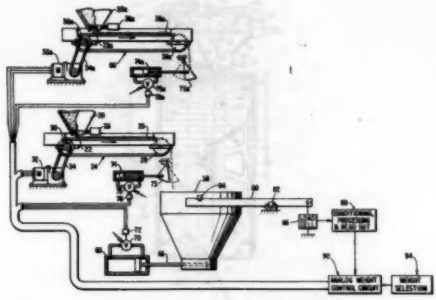
An underreamer mounted on a Kelly for adjustment and rotational driving thereby. A cylindrical housing surrounds the Kelly and mounts a pair of underreamer blades for an outward swinging thereof. A circulating flow is set up through the apparatus for continually removing the debris as it is cut by the reamer blades.

3,731,754

ELECTRICAL WEIGHING SYSTEMS

Gilbert Allan Godwin, Oakland, N.J., and Chapin A. Pratt, Rutland, Vt., assignors to Howe Richardson Scale Company, Clifton, N.J.

This application Nov. 5, 1971, Ser. No. 196,235
Int. Cl. G01g *13/14*
U.S. Cl. 177—165 2 Claims



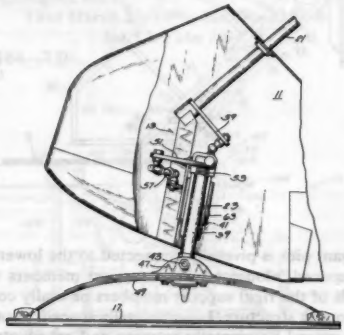
A weighing apparatus and method wherein an electrical analog signal, having a level representative of the weight of a load, is converted into a digital pulse train by an analog-to-digital converter. A counter for counting the converter-produced pulses is connected to one or more devices that provide a read-out of the weight in visual and/or printed form. A program circuit is operatively connected to the converter and the counter, and selected circuit connections are made in the program for providing a selected one or more of the following conditions: (1) the division of the pulse train by a pre-selected divisor to count in only the quotient at the counter (2) the transfer of selected information from the counter to the read-out devices to cause the weight to be read out by counting in any of a plurality of different increments such as ones, twos or fives. Additional features pertain to tare circuits for taring the weight-representing signal.

3,731,755

TURN AND BANK STEERING SYSTEM FOR SNOWMOBILES

Robert Dretzka, South Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed April 8, 1971, Ser. No. 132,440
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R 8 Claims



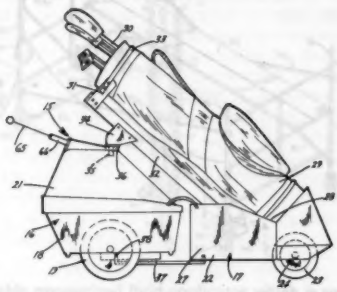
Disclosed herein is a snowmobile with a front cross bar having, at the opposite ends thereof, skis mounted for rotary movement relative to the cross bar about respective axes, and guide means mounting the cross bar on a frame for transverse movement along a path such that one ski is lowered and the other ski is raised in response to transverse movement of the cross bar in one direction and such that the other ski is lowered and the one ski is raised in response to transverse movement of the cross bar in the opposite direction. The disclosed snowmobile also includes a connection between a steering column and the cross bar for transversely displacing the cross bar in response to steering movement of the steering column, and connections between the frame and each of the skis to provide common swinging of the skis about respective generally upright axes in response to transverse cross bar movement.

3,731,756

GOLF CART AND CONTROL THEREFORE

Chester S. Hajec, 2195 West Hwy. 36, Roseville, Minn.

Filed Oct. 29, 1970, Ser. No. 85,129
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.5 11 Claims



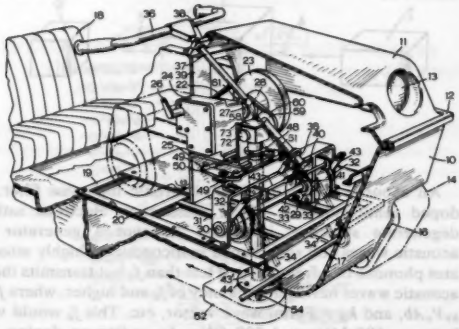
A motorized cart for use for carrying golf clubs and the like which has a power unit and a trailing load support member. The power unit includes drive motors which are electrically driven from storage batteries kept in the load support unit, and which will steer the vehicle in response to movements of a cord attached to the person using the cart so that it will follow him exactly by using differential steering for the two wheel power unit which leads the trailing load support unit.

3,731,757

STEERING MECHANISMS

Mihaly Bozsik, P. O. Box 47, R. R. No. 5, Hamilton, Ontario, Canada

Filed April 6, 1971, Ser. No. 131,752
Int. Cl. B62d *11/08*
U.S. Cl. 180—6.26 1 Claim



A steering mechanism for an all-terrain vehicle has an auxiliary steerable member connected to the steering member for

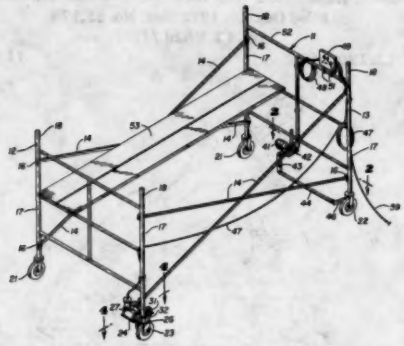
control of another steerable terrain-engaging member such as a ski or water jet pump mounted thereon. The auxiliary steerable member includes a power-output shaft driven from the engine and driving the impeller of the jet pump unit. This auxiliary power output shaft can also be used to drive power devices mounted on the vehicle such as a snow-blower or grass-cutter.

3,731,758

SCAFFOLD DRIVE AND STEERING UNIT

James Hibma, Westminster, Colo., assignor to Anne Marie Hibma, County of Adams, Westminster, Colo., a part interest

Filed Jan. 4, 1971, Ser. No. 103,555
Int. Cl. B60k 7/00
U.S. Cl. 180—11 **9 Claims**



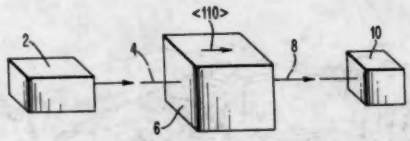
A scaffold unit for construction and maintenance activities which provides a reversible drive motor at a fixed support wheel for propelling the scaffold and a motorized steering apparatus for the directional control of said scaffold by steering at least one castor mounted support wheel. The drive and steering motors are connected to a control panel that is movable to various elevated and/or remote locations. Electric drills may be used for said motors.

3,731,759

ACOUSTIC FILTER

Duane G. Carlson, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed March 15, 1972, Ser. No. 234,943
Int. Cl. H03h 9/00
U.S. Cl. 181—0.5 F **6 Claims**



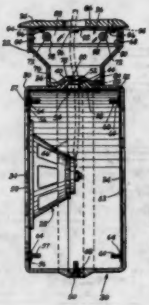
An acoustic analogue of an electronic high-pass filter. A doped semiconductor, whose conduction electrons satisfy degenerate statistics, is placed adjacent a generator of acoustic waves and such doped semiconductor highly attenuates phonons of a frequency of less than f_o but transmits those acoustic waves having a frequency of f_o and higher, where $f_o = {}_{sp}V_o Ab$, and k_F = Fermi wave vector, etc. This f_o would vary between 500 MHz and 500 GHz, depending on doping. By employing such high-pass filter in series with a superconductor low-pass filter, one can obtain a highly monochromatic beam of phonons.

3,731,760

HIGH SECURITY LOUD SPEAKER BAFFLE

Josef J. Hammes, St. Louis, Mo., assignor to Lowe Manufacturing Company, St. Louis, Mo.

Filed Dec. 16, 1971, Ser. No. 208,779
Int. Cl. G10k 13/00; H04r 1/28
U.S. Cl. 181—31 B **9 Claims**



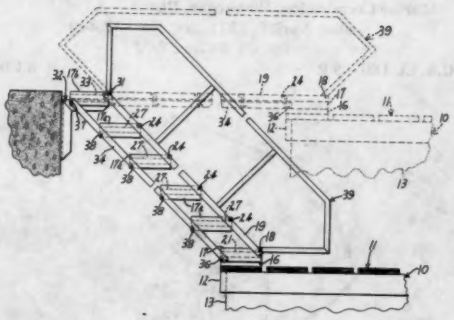
A high security loud speaker baffle for use in institutions such as prisons and the like to resist vandalism. The baffle is comprised of a pair of concave castings constituting a hollow baffle receiving a loud speaker. Each of the castings has a rim portion, one of which is exterior and the other interior, interfitting with one another and butting against shoulders. The two interfitted concave castings can be supported within a cradle receiving the rim portion and connected by tamper-proof screws to resist removal. The hollow loud speaker baffle comprised of the interfitted concave castings in addition to being used as a bidirectional baffle with the cradle can be simply employed by connecting one of the castings directly to a wall surface to provide a unidirectional baffle.

3,731,761

FLOATING PIER WITH SELF ADJUSTING STAIRWAY ASSEMBLY

Raymond D. Glenn, P.O. Box 6, Cropwell, Ala.

Filed Aug. 19, 1971, Ser. No. 173,062
Int. Cl. E06c 1/38
U.S. Cl. 182—1 **1 Claim**

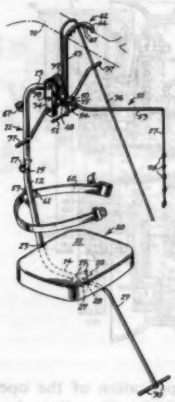


A buoyant pier is pivotally connected to the lower ends of laterally spaced, elongated, rigid support members with the other ends of the rigid support members pivotally connected to a supporting structure. Longitudinally spaced, parallel stair members extend horizontally between and are pivotally connected to the rigid support members. Other elongated support members extend between and are pivotally connected to the pier and the supporting structure to support and retain the stair members in parallel relationship as the pier moves to various elevations.

3,731,762
HUNTING CHAIR

Joe M. Sirls, Whitthorne Drive, Lavania, Tenn.

Filed Oct. 7, 1971, Ser. No. 187,446
Int. Cl. A47c *1/00, 7/52;* A63b *71/00*
U.S. Cl. 182—142 8 Claims



A hunting chair having a bow-shaped frame member including an intermediate back frame, a forwardly projecting upper head frame, and a forwardly projecting lower seat frame; a seat member detachably secured to the seat frame, a detachable lifting mechanism secured to the head frame, and a flexible linear member having one end fixed to the lifting mechanism and a free end adapted to be projected over an overhead support, such as a tree bough. The chair further includes a hanger rod having an arcuate upper portion for seating over the top of the bough and a lower portion attachable by swivel means to the head frame after the frame member has been elevated to a position adjacent the bough.

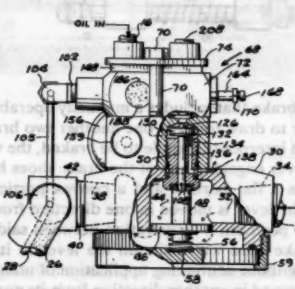
A foot rest, safety belt, and rifle support are also detachably secured to the frame member.

The seat member is provided with means for securing the detachable elements, normally secured to the frame member, to the seat member to provide a compact back-pack.

3,731,763
LUBRICATING APPARATUS

George E. Thrasher, Jr., Pontiac, and John T. Bertva, Utica, both of Mich., assignors to Master Pneumatic-Detroit, Inc., Sterling Heights, Mich.

Filed March 25, 1970, Ser. No. 22,502
Int. Cl. F16n *7/34*
U.S. Cl. 184—7 D 20 Claims

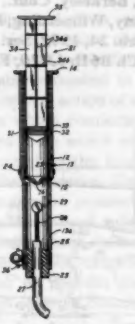


A sensing disc is mounted for movement responsive to starting of a flow of air in a passageway through which air is furnished to a pneumatic tool. Such movement operates valving to admit air under pressure through a branch passageway for actuating a lubricant pump. The sensing disc is spring returned upon discontinuation of the air flow, and return movement thereof closes the valving. The pump delivers a predetermined quantity of lubricant to the tool upon each starting of air flow in the passageway.

3,731,764
PRESSURIZED FLUID APPLICATOR FOR SHEATHED CABLES AND THE LIKE

Robert L. Workman, 7610 S. Boulder Road, Boulder, Colo.

Filed Feb. 19, 1971, Ser. No. 116,834
Int. Cl. F16n *13/08*
U.S. Cl. 184—15 R 5 Claims

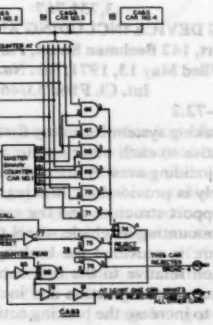


A portable pressurized fluid applicator which is specifically adapted for cleaning or lubricating sheathed cables and the like comprises a relatively rigid cylinder and a relatively flexible tubular extension on one end of the cylinder. A plunger member moves axially through the cylinder to force a fluid into the tubular extension. A sleeve adapter is placed around the end of the sheath for insertion into the open end of the tubular extension, and an adjustable clamp is positioned over the flexible tubular extension to contract the extension and adapter into fluid-tight, clamping engagement with the cable sheath whereby the fluid discharged into the extension will be forced through the space between the cable sheath and cable.

3,731,765
MULTIPLE DIGITAL COMPARATOR

Gerald D. Robaszkiewicz, Toledo, Ohio, assignor to Reliance Electric Company, Euclid, Ohio

Filed June 9, 1971, Ser. No. 151,437
Int. Cl. B66b *1/18*
U.S. Cl. 187—29 R 18 Claims



A multiple digital comparator for ascertaining the largest or smallest count in a plurality of counters by progressively

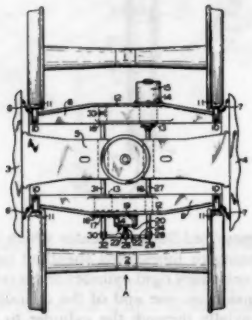
scanning all of the counter's outputs from the most to least significant bits and rejecting those counters having bits set when other counters have those bits reset for the least count selection and by progressively scanning all the counter's outputs from the most significant bit to the least significant bit while rejecting those counters having bits reset when other counters have those bits set for the selection of the counter with the greatest count. Equal counts can be accommodated by an order of preference of selection so that only one counter is selected as having the least or greatest count. The comparator is illustrated for the selection of the least count as accumulated in counters individual to elevator cars whereby the car best situated to serve a call receives an assignment of that call.

3,731,766

BRAKE RIGGING FOR RAILWAY CAR TRUCKS

James A. Campbell, Berkeley, Calif., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Feb. 24, 1972, Ser. No. 229,042
Int. Cl. B61h *13/20*; F16d *65/66*
U.S. Cl. 188—52 **15 Claims**



A railway car truck mounted brake rigging in which a slack adjuster mounted on one of a pair of spaced apart brake beams is connected to an equalizer lever intermediate its ends which are in turn connected by push rods to the other brake beam on which is carried a single brake cylinder having its piston operatively connected to the one push rod to spread the brake beams into brake position responsive to the supply of fluid pressure to the brake cylinder. A plurality of embodiments are disclosed covering various methods of incorporating a handbrake with the brake rigging in order to provide slack adjusted handbrake operation as well as pneumatic operation without requiring that the rigging be altered significantly for use on a truck not having a handbrake connected thereto.

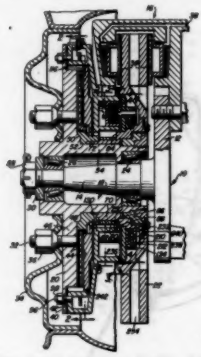
3,731,767

BRAKING DEVICE INCLUDING ANTI-SKID MEANS

Louis A. Lefort, 142 Beehman Street, Plattsburgh, N.Y.

Filed May 13, 1971, Ser. No. 142,888
Int. Cl. F16d *55/46*
U.S. Cl. 188—72.2 **17 Claims**

A wheel braking system including first and second sections rotatable relative to each other and to a wheel support structure about coinciding axes. A first vehicle operator controlled brake assembly is provided for braking the first section relative to the support structure and the second section includes structure for mounting a vehicle wheel thereon. Also, second brake structure is provided for braking the second section against rotation relative to the first section with a predetermined minimum braking action and includes automatic control structure to increase the braking action thereof to prevent rotation of the second section relative to the first section in response to the second section rotating relative to the first section. Also, the second brake structure controls are operative, in response to termination of rotation of the second section relative to the first section due to an increased braking action thereon by the second brake structure as a result of rotation of the second section relative to the first section, to reduce the braking action of the second section relative to the first section to the aforementioned predetermined braking action or



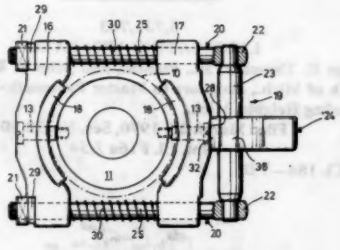
force, whereby full application of the operator controlled brake assembly of a vehicle will result in the braked wheel or wheels of that vehicle being braked by rapidly alternating increasing and decreasing braking forces even though the operator of the vehicle may "freeze" on the brake control with the latter fully applied.

3,731,768

EXTERNAL SHOE BRAKE PARTICULARLY FOR SPINNING AND TWISTING SPINDLES

Gustav Fetzer, 7344 Gingen, Germany, assignor to Firma Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung, Postfach, Ebersbach, Germany

Filed April 13, 1971, Ser. No. 133,559
Claims priority, application Germany, Dec. 5, 1970, G 70 44 944.4
Int. Cl. F16d *49/16*
U.S. Cl. 188—75 **10 Claims**



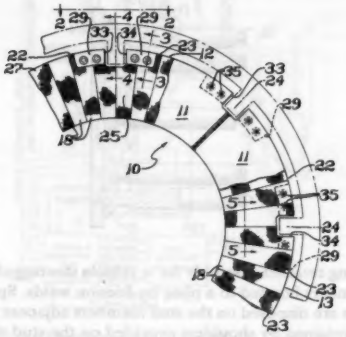
In a friction brake that includes a manually operable pivotable brake lever to draw towards one another two brake shoes for engaging an interposed spindle to be braked, the work face of the brake lever engaging one of the brake shoes has a contour which has a flat portion and a convex portion spaced therefrom. If the lever is moved in one direction from its normal (released) position, a cooperation between said flat portion and a brake shoe will maintain the lever in its braking position even without continuing application of manual force. If the lever is moved in another direction from its normal position, a cooperation between said convex portion and said brake shoe will continuously urge said lever from its braking position into its normal position.

3,731,769

FRICTION MEMBER ASSEMBLY

William Edwin Ely, Troy, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,894
Int. Cl. F16d 65/10
U.S. Cl. 188—218 XL 9 Claims



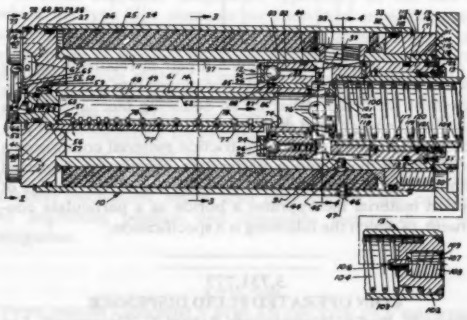
An annular friction member assembly for a disc type brake or clutch having segments of heat absorbing material sandwiched between and supported by facing members of carbon composite material. The facing members have driving lugs located at positions spaced from the heat-swept area for transmitting torque forces directly from the friction surfaces of the facing members to an associated brake or clutch part. Reinforcing members are located at the driving lugs and provide additional bearing area as well as added support to the facing members of carbon composite material to prevent failure under torque loads at the fasteners holding the facing members and the segments of heat absorbing material together.

3,731,770

ADJUSTABLE SHOCK ABSORBER

Glyn A. Bindon, Oxford, Mich., assignor to Ace Controls, Inc., Farmington, Mich.

Filed May 19, 1971, Ser. No. 144,894
Int. Cl. F16f 9/44
U.S. Cl. 188—285 23 Claims



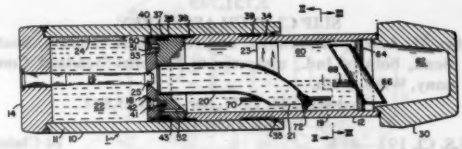
An adjustable hydraulic shock absorber having a shock receiving piston means telescopically mounted over an axially disposed fluid metering tube means provided with a plurality of metering orifices, and means for adjusting the effective cross sectional areas of the metering orifices.

3,731,771

PNEUMATIC-HYDRAULIC SHOCK ABSORBER

Norman J. Borgo, Coraopolis, Pa., assignor to Pittsburgh Forgings Company, Coraopolis, Pa.

Filed Feb. 17, 1972, Ser. No. 227,063
Int. Cl. F16f 9/06; B61g 9/08
U.S. Cl. 188—289 4 Claims



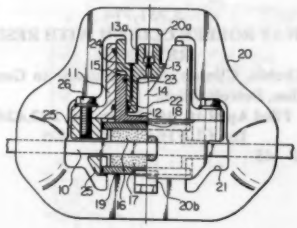
My improvement is directed to a pneumatic-hydraulic shock absorber having a high pressure chamber formed by a cylinder and a low pressure chamber formed in the hollow portion of a piston slidably mounted in the cylinder, The shock is absorbed by a throttling action of a metering pin positioned in a deflector tube which connects the two chambers and the entrapped gas and foam which settle out in the high pressure chamber is returned to the low pressure chamber means by a passageway therebetween. The improvement is a bulkhead which partitions the low pressure chamber into two separate chambers connected through a sloped tube extending through the bulkhead. Baffles and deflector plates are employed in one of the partitioned chambers to control the movement of fluid so as to prevent the entrapment and transfer of gas into the high pressure chamber.

3,731,772

DISC BRAKE FOR MOTOR VEHICLES

Shunichi Toshida, and Takashi Ozora, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed April 13, 1971, Ser. No. 133,543
Int. Cl. B60t 11/20
U.S. Cl. 188—345 8 Claims



A disc brake for an automotive hydraulic brake system having main and auxiliary brake lines, which disc brake includes a rotatable braking disc, a pair of friction pads positioned on either side of the braking disc, main and auxiliary fluid chambers into which fluid under pressure is introduced through the brake lines for moving the friction pads to positions to grip the braking disc and a yoke moved by means of the pressurized fluid to move one of the friction pads into its braking position, the main and auxiliary fluid chambers being isolated by two spaced sealing rings and a drain passage being provided which originates from between the two sealing rings whereby, in case one of the sealing rings fails during operation, the braking action is satisfactorily initiated and the leakage of the fluid

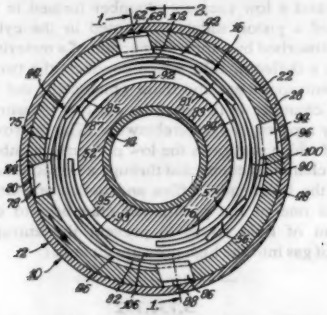
through the drain passage and the decrease in the level of the fluid in the cylinder reservoir provides a visual indication of the failure of the sealing ring to the driver of the motor vehicle from observation of a decrease in the fluid pressure in the master cylinder. Arrangements are further made to free the yoke from a braking torque which is otherwise imparted thereto from the friction pads during braking operation.

3,731,773

SLIP CLUTCH ASSEMBLY

Max M. Austin, Mishawaka, and Norman B. Boulton, South Bend, both of Ind., assignors to National-Standard Company, Wiles, Mich.

Filed Sept. 24, 1971, Ser. No. 183,541
Int. Cl. F16d *41/20*
U.S. Cl. 192—41 S **14 Claims**



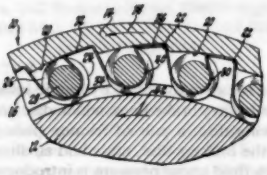
A band clutch assembly of the overrunning type designed to slip at a predetermined torque. A clutch band has a preformed spring section which cooperates with the underlying or overlying arcuate portion of an adjacent band section to provide a controlled compounding of the tip end of the band, which ceases at a predetermined applied torque to permit the band to slip.

3,731,774

ONE WAY ROLLER CLUTCH WITH RESILIENT RETAINER

Oscar G. Kitchin, Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed April 10, 1972, Ser. No. 242,424
Int. Cl. F16d *15/00, 41/06*
U.S. Cl. 192—45 **3 Claims**



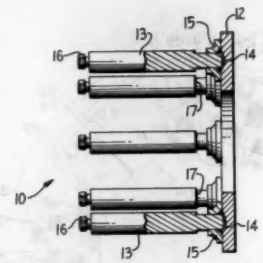
A one way roller clutch has a resilient retainer of generally annular form which holds the clutch rollers in unit handled relationship with the outer clutch race and which also biases the clutch rollers toward a position of wedging engagement between the clutch races.

3,731,775

CLUTCH SPRING RETAINER ASSEMBLY

Larry A. Brown, and James W. McMichael, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 21, 1971, Ser. No. 191,436
Int. Cl. F16d *13/44*
U.S. Cl. 192—89 R **2 Claims**



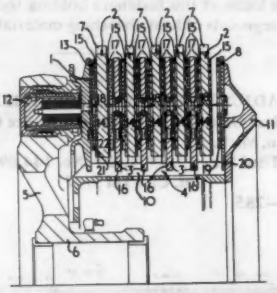
A spring retainer assembly for a vehicle steering clutch has stud members bonded to a plate by friction welds. Spring seat members are disposed on the stud members adjacent the plate and are retained by shoulders provided on the stud members. The ends of the stud members projecting from the plate are tapped to receive capscrews.

3,731,776

FRICTION MECHANISMS

Ronald Fisher, c/o Fort Dunlop, Erdington, Birmingham 24, Rudby, England

Filed March 15, 1971, Ser. No. 124,103
Claims priority, application Great Britain, March 19, 1970, 13,237/70
Int. Cl. F16d *13/60, 69/02*
U.S. Cl. 192—107 M **9 Claims**



A friction mechanism in which a pair of relatively rotable friction members are arranged to be moved into and out of engagement with each other by an actuating mechanism. The surfaces of engagement of the friction members are each provided with a facing of sintered friction material comprising a matrix constituent and a particulate constituent dispersed within the matrix constituent. At least one of the facings of friction material incorporates a boride as a particulate constituent, of which the following is a specification.

3,731,777

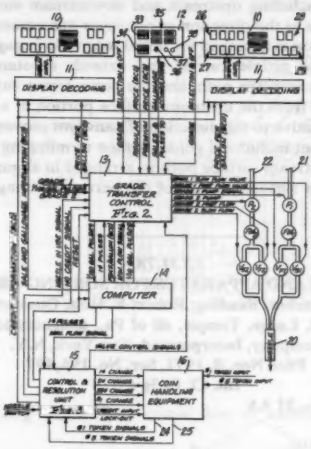
COIN OPERATED FLUID DISPENSER

William F. Burke, Westminster; Robert C. Greenwood, Los Angeles, and Thomas E. Jones, Costa Mesa, all of Calif., assignors to Pan-Nova, Inc., Santa Fe Springs, Calif.

Filed July 26, 1971, Ser. No. 165,449
Int. Cl. G07f *13/00*
U.S. Cl. 194—13 **15 Claims**

A coin operated system for selectively dispensing premium and regular grades of gasoline utilizing a single coin handling

unit, computer and dispensing control. An electronic system for registering payment, controlling the amount of fluid



dispensed, and making exact change for unused payment. A dispenser adaptable to various monetary systems and to various coin input ranges and to various coin return ranges.

3,731,778

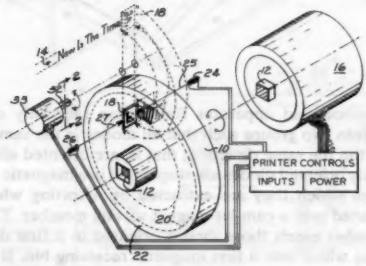
PRINTER HAVING INDIVIDUAL CHARACTER CHIPS

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn.

Filed July 15, 1970, Ser. No. 54,876

Int. Cl. B41j *23/02*

U.S. Cl. 197—16 **8 Claims**



A serial character teleprinter, typewriter or the like in which the type face elements are individual small flat chips each having a single character on a main flat face thereof, the chips being of minimal thickness and having uniform profile dimensions only slightly larger than the outline or envelope dimensions of the largest character (or numeral or sign) included in the font. The chips forming a complete font-set are carried in a magazine, for example edgewise in individual radial guide slots formed in a turret wheel or drum which is rotated to bring any selected chip into transfer relation to a transfer mechanism, which, after receiving the chip, carries it to imprinting position and thereafter restores it to the magazine.

3,731,779

TYPE DRUM ASSEMBLY FOR AN ON-THE-FLY PRINTER

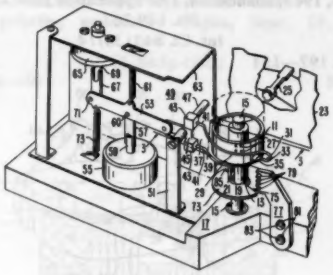
Nicholas Kondur, Jr., Northville, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 30, 1970, Ser. No. 51,300

Int. Cl. B41j *23/04*

U.S. Cl. 197—18 **11 Claims**

A type drum assembly for an on-the-fly printer including a rotatable, cylindrical type drum, axially positionable during rotation, the drum having rows of characters grouped on its curved surface to form printing and non-printing phases of a rotation of the cylinder. A V-shaped guide, open at its small end and partially encompassing the drum, interacts with a cam follower stud on the curved surface of the drum for axially positioning the drum during the non-printing phase, the guide



being shifted by the interaction of two solenoids acting on a lever pivoted to the guide. A semicircular flange, fixed to the type drum, rides between the teeth of a comb during the print phase of a rotation of the drum for maintaining the drum at the selected axial position.

3,731,780

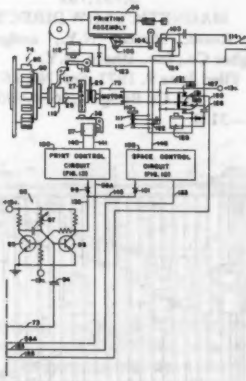
PRINTING APPARATUS AND CONTROLLING CIRCUIT THEREFOR

Arnold M. Wolf, Brooklyn, and John G. Richter, Yonkers, both of N.Y., assignors to Electrospace Corporation, Westbury, N.Y.

Continuation-in-part of Ser. No. 806,430, March 12, 1969, abandoned. This application May 10, 1971, Ser. No. 141,485

Int. Cl. B41j *1/32*

U.S. Cl. 197—49 **3 Claims**



A printing apparatus which types characters on a type wheel under control of an electric circuit. The apparatus includes a type wheel, a printing hammer, and a series of timing AND circuits. A spacing mechanism moves the wheel along a record sheet to receive the printed symbols. The characters to be printed are selected by activating one of a series of storage multivibrators connected to the AND circuits and an optical timing device coupled to the type wheel supplies timed pulses to the AND circuits to control the printing operation.

3,731,781

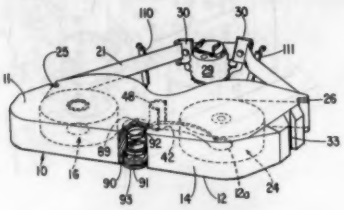
RIBBON SUPPLY CARTRIDGE

Allison H. Caudill, and Willie Goff, Jr., both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 752,096, July 16, 1968, Pat. No. 3,604,549, which is a continuation-in-part of Ser. No. 609,136, Jan. 13, 1967, abandoned. This application June 2, 1971, Ser. No. 149,267

Int. Cl. B41j *33/14*

U.S. Cl. 197—151 **5 Claims**



A cartridge, which is removably mounted on a base plate, has a supply spool and a take-up spool rotatably mounted therein with the ends of the single pass ribbon attached thereto. The bottom wall of the cartridge has a curved slot to receive a resiliently biased drive roller, which is rotatably mounted on a pivotal arm on the base plate and has pointed projections thereon for penetrating the inked ribbon on the take-up spool to linearly advance the ribbon past its printing position. The cartridge has a cylindrical recess to receive a portion of the gear train. When the ribbon is a solvent coated plastic transfer matrix whereby overstriking is desired, then resiliently biased means is disposed within the recess in the cartridge to render the change means operative to reduce the amount of rotation of the drive roller. If a total release ribbon is used wherein no overstriking is desired, then the recess in the cartridge is empty and the larger amount of rotation of the drive roller occurs because the change means is not rendered operative.

3,731,782

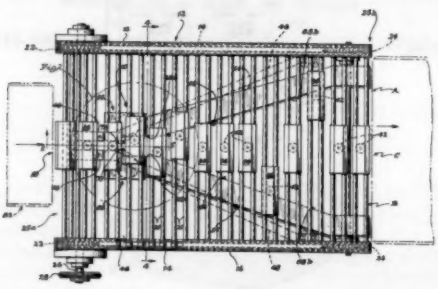
MAGNETIC FLOW DIRECTOR

Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed June 9, 1971, Ser. No. 151,218

Int. Cl. B65g *47/26, 47/00*

U.S. Cl. 198—31 R **28 Claims**



A magnetic flow director for use in combination with an article conveyor movable along a pre-determined path and having at least one article carrier supported by the conveyor for independent movement thereon under the influence of magnetic attraction transversely of the path. In a preferred form, the director includes a permanent magnet and a selectively operable electromagnet for deflecting the carrier transversely of the path for attractive engagement with a guide surface of the permanent magnet; such guide surface being characterized as including upstream and downstream surface portions relative to the direction of conveyor movement. The upstream portion is arranged for initial magnetic engagement by the deflected article carrier and extends substantially codirectionally with the path, and the downstream surface portion extends from the upstream surface portion in a diverging direction relative to the direction of conveyor movement. The electromagnet includes a guide surface terminating in a relatively downstream surface portion arranged in alignment with the upstream surface portion of the permanent magnet guide surface.

3,731,783

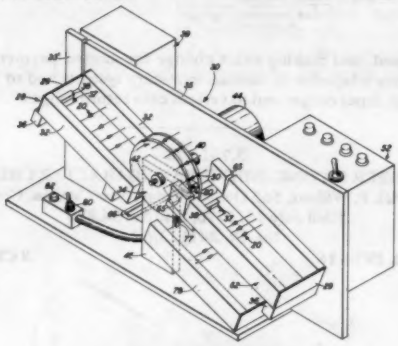
METHODS AND APPARATUS FOR SORTING ARTICLES

Donald H. Dreher, Reading; Robert E. Hess, Quakertown, and Donald M. Large, Temple, all of Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 8, 1971, Ser. No. 196,497

Int. Cl. B65g *47/24*

U.S. Cl. 198—31 AA **19 Claims**



A method and apparatus for sorting randomly oriented diodes into two groups such that all diodes in the same group conduct in the same direction; that is, are oriented alike. The randomly oriented diodes are suspended in a magnetic holding bin from which they are extracted by a sorting wheel and transported past a cam-jet-magnet sorting member. The sorting member ejects those diodes oriented in a first direction from the wheel into a first magnetic receiving bin. It assures retention, by the sorting wheel, of those diodes oriented in a second direction so that they are carried further for removal into a second magnetic receiving bin.

3,731,784

CONVEYORS

Michael Bryon Osborne, Kirkella, Hull, England, assignor to Kingston Conveyors Limited, Hull, England

Filed Dec. 21, 1971, Ser. No. 210,495

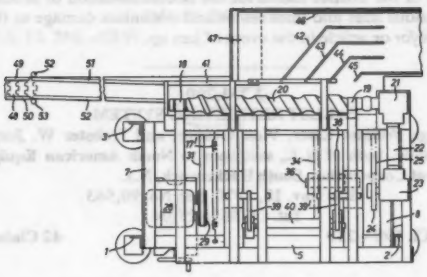
Claims priority, application Great Britain, Dec. 30, 1970, 61,832/70

Int. Cl. B65g *47/24*

U.S. Cl. 198—31 AB **3 Claims**

A mechanism for dividing a continuously moving stream of single articles fed by a conveyor belt between fixed spaced guides into a plurality of streams or stream of two or more articles abreast comprising an article feeding rotary worm laterally displaceable relative to a set of fixed guides defining a plurality of paths, an article linear-movement guide, spaced from and parallel to the lead end of worm, is movable with the lateral displacement of such worm, and a pair of spaced linear guides are pivoted with respect to the fixed spaced guides and angularly rotatable with the lateral movement of the worm and its spaced guides such that the articles fed by the conveyor are brought from juxta position into spaced relation by the

rotation of the worm and then introduced thereby on lateral displacement thereof into the several paths of the set of fixed



guides along which they move due to another conveyor belt(s).

3,731,785

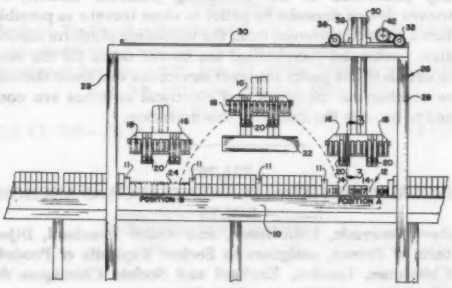
METHOD AND APPARATUS FOR FORMING TYNE LAYERS IN AUTOMATIC BRICK STACKING SYSTEMS

Gerald L. Stuart, Siler City, N.C., assignor to Forrest Paschal Machinery Company, Siler City, N.C.

Filed May 1, 1972, Ser. No. 249,031

Int. Cl. B65g *57/02, 59/02*

U.S. Cl. 198—35 **7 Claims**



Double-layer courses of bricks, with the bricks in one layer atop the bricks in the other layer, are marshalled along an index conveyor between a kiln car unstacking apparatus and a brick stacking and strapping apparatus. A pickup head is lowered to a position overlying selected courses and a first set of gripper members is activated to grip the entire upper layer while a second set of grippers, independently operated from the first set, is activated to grip selected bricks in the lower layer, the selected brick being those necessary to form the tyne openings. The pickup head is then moved vertically and horizontally to a second position where selected brick from the lower layer are deposited on a tyne brick table. The pickup head is then moved to a third position where the upper level of brick is returned to its initial position atop the lower level in the same selected course. During the pickup and depositing of the upper layer and selected bricks from the lower layer, a separator sheet or board is placed atop the lower layer either automatically or manually.

3,731,786

CONVEYOR BELT FOR BELT FISSURE DETECTION APPARATUS

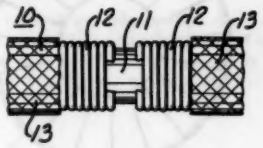
Zenji Nagata; Masamitsu Ui, both of Komaki, and Tokio Fujimoto, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka; Tokia Rubber Industries, Ltd., and Aza Utatsu Oaza Kitaloyama, Komaki, all of Japan

Filed Sept. 21, 1970, Ser. No. 74,089

Claims priority, application Japan, Sept. 19, 1969, 44/89949

Int. Cl. B65g *43/02*

U.S. Cl. 198—40 **5 Claims**



A conveyor belt designed for employment in combination with a conveyor belt fissure detection apparatus wherein at consecutive intervals there is embedded in the interior of the conveyor belt a loop detection coil consisting of a plurality of conductors each having a flexible stranded core around which is spirally wound a metallic wire. The conductors are bound together by welt threads of synthetic material to insure independent flexibility of the separate conductors as bound together.

3,731,787

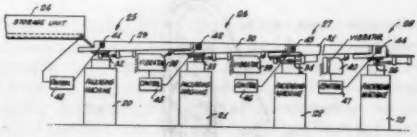
MODULAR DISTRIBUTOR SYSTEM FOR BULK MATERIAL

Vaughn Gregor, 1830 West Olympic Blvd., Los Angeles, Calif.

Filed Nov. 16, 1970, Ser. No. 89,941

Int. Cl. B65g *37/00*

U.S. Cl. 198—82 **19 Claims**



A vibratory distributor system for supplying bulk material, such as potato chips, cereal or the like, to a number of use points on demand. The system comprises a plurality of successive modules arranged to nest with one another to provide a flow path from one module to the next. Each module includes a material-carrying tray and a gate, associated with each use point, each gate having a selectively operable closure member which controls gravity feed of the material to the use point. A sensor for each module monitors the material level at the location of each gate and, when the level drops to a threshold level, activates the vibrating means of the adjacent upstream module to cause material to flow. The upstream modules are thus progressively vibrated in accordance with the demand to convey material from a source of supply downstream to the various use points.

3,731,788

ARTICLE SELECTING DEVICE

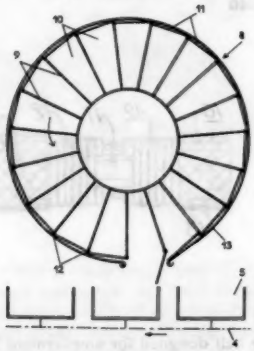
Patrick Delecroix, Hem, France, assignor to Societe Anonyme Lan Redoute, Roubaix, France

Continuation-in-part of Ser. No. 819,734, April 28, 1969. This application Sept. 2, 1971, Ser. No. 177,274

Claims priority, application France, Aug. 14, 1968, 6819169

Int. Cl. B65g *37/00*

U.S. Cl. 198—103 4 Claims



A device for picking-up articles selected among those arranged in a storage area is described as having the conveyor displacing containers each intended to receive article of a limited number of selections and passing under at least one wheel divided into sector-shaped compartments whose rotational movement is synchronized with that of the conveyor in such a way that each compartment always received the articles intended for the same container.

3,731,789

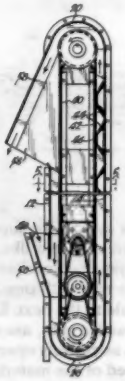
CONVEYOR FOR DOCUMENTS

Eugene T. Fleischhauer, Charlottesville, Va., assignor to Acme Visible Records, Inc., Crozet, Va.

Continuation-in-part of Ser. No. 873,472, Nov. 3, 1969, abandoned. This application Dec. 9, 1971, Ser. No. 206,308

Int. Cl. B65g *15/00*

U.S. Cl. 198—160 7 Claims



A conveyor for articles of various thicknesses includes a continuous conveyor belt driven around spaced rollers and a stationary housing that encloses the belt. Spaced groups of brushes or bristles are secured on the outwardly facing surface of the belt such that the ends of the bristles may slide across an opposed surface of the housing. The bristles are inclined toward the direction of travel or conveyance of the belt in order to catch the edges of the conveyed article and impart a positive thrust to the articles within the conveyor. The flexibility of the bristles allows for the accommodation of articles of various sizes and thicknesses and minimizes damage to the conveyor or article in the event of jam up.

3,731,790

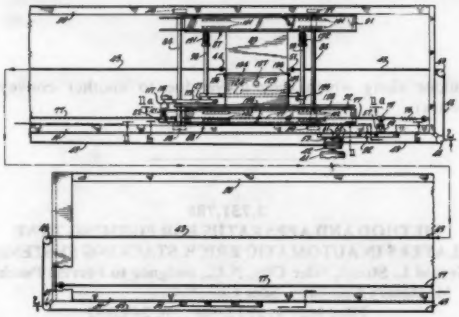
PALLET RETRIEVING SYSTEM

George William Esser, West Orange, and Webster W. Jury, Wayne, both of N.J., assignors to North American Equipment Corporation, South Hackensack, N.J.

Filed Nov. 18, 1970, Ser. No. 90,543

Int. Cl. B65g *25/04*

U.S. Cl. 198—219 42 Claims



A system is disclosed in which a motor driven retriever device brings loaded pallets deposited at a receiving station along a path to an unloading station. If another pallet is already positioned at the unloading platform station, the retriever device deposits its pallet as close thereto as possible. When a pallet is removed from the unloading platform station, pallets positioned therebehind are moved up to fill the void. The details of the pallet retriever device are disclosed showing how mechanical members and electrical switches are combined to provide the system of this invention.

3,731,791

SECURING OF FIXING ELEMENTS SUCH AS ANCHOR BOLTS

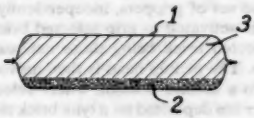
Robert Fourcade, Labuissiere, and Andre Bourland, Dijon, both of France, assignors to Societe Explosifs et Produits Chimiques, London, England and Societe Chimiques des Charbonnages de France, Paris, France

Continuation-in-part of Ser. No. 18,377, March 13, 1970, abandoned, which is a continuation of Ser. No. 583,826, Oct. 3, 1966, abandoned. This application March 15, 1971, Ser. No. 124,114

Claims priority, application Great Britain, Oct. 5, 1965, 42,301/65; France, May 9, 1966, 6660832

Int. Cl. B65d *81/32*

U.S. Cl. 206—47 A 3 Claims



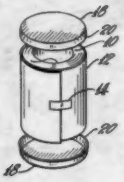
Sealing cartridges are provided which comprise an outer frangible casing and distributed in the casing, a composition based on an unsaturated polyester resin together with a catalyst composition longitudinally disposed within the casing and in direct contact with the resin composition.

3,731,792

NONSLUMPING GLASS FIBER PACKAGE

John A. Rolston, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Feb. 8, 1971, Ser. No. 113,218
Int. Cl. B65d *85/671*
U.S. Cl. 206—52 W 3 Claims



Glass fibers coiled in layers into a generally tubularly shaped package, and in which the layer of fibers adjacent one of its generally cylindrical shaped surfaces, is adhered to the surface of a support by a tacky or adhesive material. The degree of tack is such as to hold the layer of coils in position on the support even though the remainder of the layers of coils have been removed, at least to a degree where they no longer support the remaining layer of coiled fibers. The degree of adhesion is such as to allow the adhered fibers to be pulled from the surface of the support without damage to the fibers. The support can be a sheet material, and in the preferred embodiment, is applied to the outside generally cylindrical surface of a tubular package of fibers to form one part of a protective container for the package. Caps may be telescoped over the opposite ends of the package to cooperate with the sheet material and completely incase the package of glass fibers.

3,731,793

FILLED PACKAGE CONTAINING A COILED STRING OR THE LIKE

Herbert N. Hagel, Mountainside, N.J., assignor to National Musical String Company, New Brunswick, N.J.

Division of Ser. No. 4,621, Jan. 21, 1970. This application May 19, 1971, Ser. No. 144,805
Int. Cl. B65d *85/04*
U.S. Cl. 206—52 W 1 Claim

A package is comprised of two thin sheets, preferably rectangular and sealed to one another along their outer margins. One of the sheets has a relatively large centrally located filling opening. A strong or string like member is contained in the package between the two sheets and in surrounding relation to the central opening. The two sheets are additionally sealed to one another around the margin of the central opening, or the central opening is sealed by an overlying sheet, to totally isolate the package contents from the surrounding atmosphere.

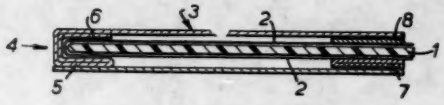
3,731,794

PACKAGING GRAMOPHONE RECORDS

Norman John Garrod, Great Common, Bletchingley, England

Filed Feb. 8, 1972, Ser. No. 224,488
Claims priority, application Great Britain, March 1, 1971, 5,727/71; March 30, 1971, 8,256/71
Int. Cl. B65d *85/30*
U.S. Cl. 206—62 P 13 Claims

A package for a gramophone record includes an outer sleeve comprising a pair of side members connected on three edges by flaps integral with one side member and each folded to provide a spine and a marginal flap adhered to the other side member, and an inner sleeve for receiving a record and provided with a spacer on one side member thereof which



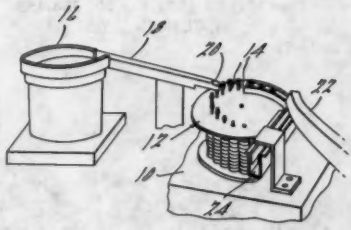
faces the other outer sleeve side member, the spacer having a thickness equal to the thickness of that part of each marginal flap overlapped by a record when received in the package. The spacer may be adhered to or integral with the inner sleeve.

3,731,795

NUT GAUGING MACHINE

Arthur E. Velthoven, Warren, Mich., assignor to Federal Screw Works, Detroit, Mich.

Filed March 16, 1972, Ser. No. 235,207
Int. Cl. B07c *5/06*
U.S. Cl. 209—73 10 Claims



A machine for gauging lock nuts of the type in which the nut body is squeezed to distort a portion of the thread thereof. Adequately squeezed nuts are segregated from nuts which have either been squeezed insufficiently or not squeezed at all. A rotating carriage on the machine has probes on which the nuts are deposited. The nuts are discharged from the carriage through one of two unloading stations, depending upon whether or not the probes have been able to pass through the holes of the nuts.

3,731,796

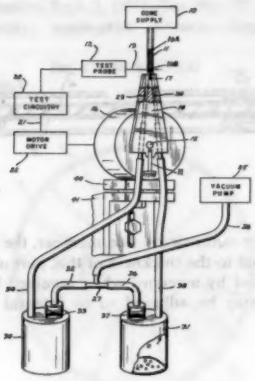
SORTING DEVICE FOR CORE HANDLER

Nathan R. Smith, Minneapolis, Minn., assignor to Ramsey Engineering Company, St. Paul, Minn.

Filed May 6, 1971, Ser. No. 140,726
Int. Cl. B07c *5/00*
U.S. Cl. 209—74 20 Claims

A sorting mechanism for magnetic core handlers utilizing a sort gate or block that is provided with tubular openings, and is directly attached to the output shaft of a conventional stepper motor that has a shaft which can be rotated between a neutral position and at least one position from neutral. The gate is shifted directly by the movement of the motor shaft in

response to a test signal for a core being tested, and suitable vacuum means can be supplied to the sorting chambers to



exert a vacuum force to pull tested cores through the properly aligned opening in the sort block.

3,731,797

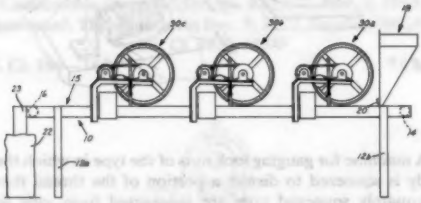
SPLIT BEAN CLEANING METHOD AND APPARATUS

Harold D. Tanner, Cahone, Colo., assignor to Harold R. Tanner, Cahone, Colo.

Filed May 18, 1972, Ser. No. 254,453

Int. Cl. B07b *13/00*

U.S. Cl. 209—78 **12 Claims**



A relatively thick layer of soft, resilient, foamed, elasto-plastic material pressed on split beans in a single layer removes goathead weed pods from the beans. In one form, a roller coated with the elasto-plastic, foamed material rolls over a single bean layer for cleaning the same.

3,731,798

SIZER CONVEYOR

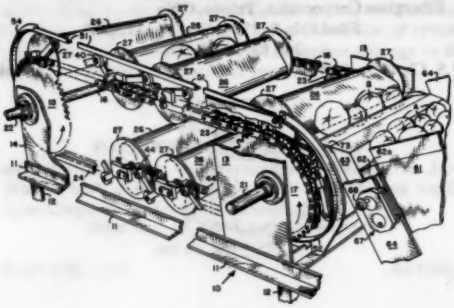
Earl R. Anderson, Los Gatos, Calif., assignor to Brex Corp. Trustee, Los Gatos, Calif.

Continuation-in-part of Ser. No. 684,893, Nov. 6, 1967, abandoned. This application Dec. 28, 1970, Ser. No. 101,942

Int. Cl. B07b *13/04*

U.S. Cl. 209—98 **4 Claims**

An endless series of grading elements are carried through a grading path and provide grading openings between each adjacent pair. Each grading element has parallel side walls joined by end surfaces and control cam means effect tilting of the



respective elements to determine the size of the grading openings therebetween.

3,731,799

AUTOMATIC CASHIER FOR BANK-NOTES

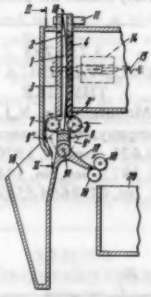
Mario Meloni, Muri, and Paul Keller, Rufenacht, both of Switzerland, assignors to Autelca AG, Gumligen, Switzerland

Filed Nov. 11, 1971, Ser. No. 197,646

Claims priority, application Switzerland, Nov. 12, 1970, 18342/70

Int. Cl. B07c *5/342*

U.S. Cl. 209—111.7 **10 Claims**



An automatic changer for paper bank-notes has a testing chamber into which a note is vertically inserted through a slot from which it slides along a pair of vertical guides into the testing chamber and is held therein in substantially stretched position against a closure mechanism. Three light sources are provided in conjunction with photo-electric receiving circuits to test the width and length of the note or bill for genuineness while the bill is held flat by a solenoid actuated movable wall within the testing chamber. The closure mechanism includes output feed roller means and a deflector mechanism in the path of the bill which are operable by the said circuits to feed the bill into a return box if the test result is negative or divert the bill into a cash container if the test result is positive.

3,731,800

COUNTER-CURRENT CENTRIFUGAL DEVICE AND USE

William J. Timson, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

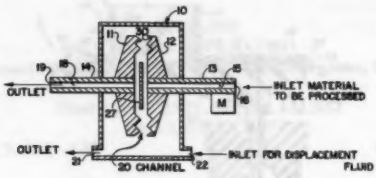
Filed Nov. 27, 1970, Ser. No. 93,038. The portion of the term of this patent subsequent to March 3, 1987, has been disclaimed.

Int. Cl. B04b *5/12*

U.S. Cl. 209—211 **15 Claims**

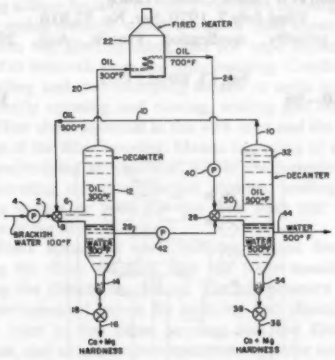
An apparatus which includes a housing defining a chamber therein, at least two rotatable plates in spaced, face-to-face

relationship defining a channel therebetween; at least one inlet for feeding fluid material into the channel; a plurality of spaced outlets for removing the processed material, at least one of which is spaced radially from the center of rotation of the plates, and means for interrupting the laminar flow in said channel, preferably by means of a zig-zag configuration in at least a portion of the surface of said plates, more preferably



adjacent the periphery. A counter-current flow pattern is provided by introducing a displacement fluid into the channel. Preferably, the plates are mounted on the same shaft and the inlet for material to be processed is through one plate adjacent to the shaft, and one outlet is through the other plate adjacent to the shaft. The apparatus can be used as a classifier, concentrator, or for washing materials of different density or the same density and different mass.

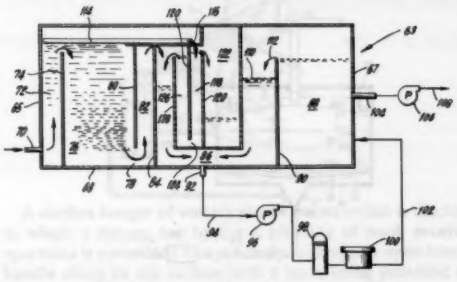
3,731,801
WATER PURIFICATION
Howard V. Hess, Glenham, and Frank E. Guptill, Jr., Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed March 15, 1971, Ser. No. 124,389
Int. Cl. C02b *1/22, 5/00*
U.S. Cl. 210—56 **3 Claims**



Method of separating from hard water dissolved mineral hardness constituents whose solubility varies inversely with temperature, in which the water temperature is raised by direct, preferably cocurrent contact with a preheated stream of liquid hydrocarbon oil, to a temperature sufficient to precipitate hardness constituents but below the temperature at which the hot oil will extract water, and at a pressure sufficient to maintain the oil and water in liquid phase.

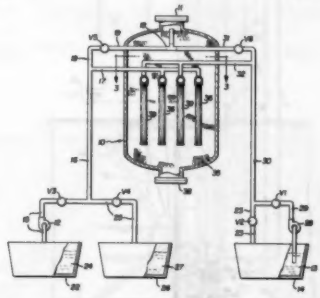
3,731,802
LIQUID SEPARATOR
William S. James, 1483 Pine Knoll Lane, Mamaroneck, N.Y.
Filed March 23, 1971, Ser. No. 127,142
Int. Cl. B01d *17/00*
U.S. Cl. 210—71 **14 Claims**

A device for separating two liquids of different density includes a closed tank having an entry section of relatively small area with an overflow into a relatively large area settling tank. The large area settling tank has a withdrawal portion at its top which permits overflow of the lighter liquid into a trough and delivery downwardly into a relatively small area intermediate tank portion. The small area intermediate tank portion in turn has an overflow only for oil into a recovery tank at one end of the device. The lower end of the intermediate small area tank has a lower connecting passage to a second intermediate tank which overflows at the top into a small area collecting tank for



delivery out of the apparatus. The large area settling tank has a lower connecting passage for the flow of the heavier liquid into a heavy liquid collection passage which overflows to the outlet which is provided in the second small area outlet tank. The arrangement is such that the flow of the heavier liquid takes place from one end of the device to the outlet and there is a further counterflow of this heavier liquid from the lighter liquid collecting storage back to the second outlet tank for the heavier liquid.

3,731,803
METHOD OF OPERATING A FILTER BED OF FINE GRANULAR MEDIA
Gene Hirs, Detroit, Mich., assignor to Hydromation Filter Company, Livonia, Mich.
Filed Nov. 2, 1970, Ser. No. 85,857
Int. Cl. B01d *23/24*
U.S. Cl. 210—80 **5 Claims**

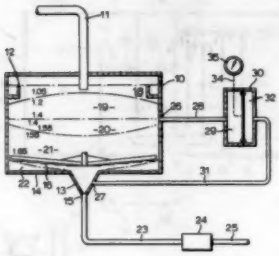


This invention provides a method of and apparatus for the deep bed filtration of a liquid containing fine particles (generally on the order of less than 0.005 inches) to obtain an effluent of exceptional clarity. It has been discovered that filtration to this degree of clarity requires a compacted filter medium bed and that this bed compactness must be preserved during rejuevenation of the bed to avoid the dispersal of previously removed dirt particles throughout the filter medium. In this invention, the rejuevenation of the bed is carried out by the reverse flow of liquid through the bed at a flow rate at least twice the flow rate during filtration and without disturbing the configuration or compactness of the bed.

3,731,804
CONTROL OF SENSITY OF THICKENER UNDERFLOW SLURRY

Gerrit Richard Kampjes, and Ronald Ian Wilson, both of Alberta, Edmonton, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Ontario, Canada

Filed Jan. 18, 1971, Ser. No. 107,116
Int. Cl. B01d 21/24
U.S. Cl. 210—83 4 Claims

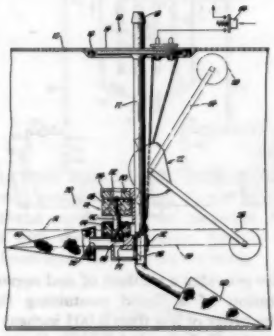


The low and high pressure sides of a differential pressure meter are communicated by means of water purged conduits to tap points in the side of a thickener. The tap points are at different elevations and by means of the meter, the differential pressure of the slurry within the thickener at the tap points is continuously monitored. The rate of removal of underflow slurry discharged from the thickener is regulated in response to monitored changes in the differential pressure such that a desired solids to liquid ratio is maintained within the thickener.

3,731,805
ONE-TANK SAFETY FUEL RESERVE

Robert C. Schniers, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1971, Ser. No. 171,618
Int. Cl. B01d 29/42
U.S. Cl. 210—86 4 Claims

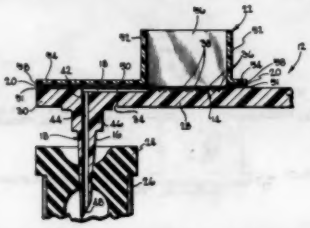


A tank discharge and indicating unit having means to indicate when a liquid in a tank, such as a gasoline tank on an automobile, reaches a reserve level and means to permit transfer of the reserve fuel from the tank. Such a unit will be very useful in automobile gas tanks whereby the driver will become aware immediately that he is on low fuel, and can through the means of my invention switch to a reserve supply.

3,731,806
SPECIMEN ANALYSIS DEVICE

James B. McCormick, Hinsdale, Ill., assignor to Pelam Inc., Hinsdale, Ill.

Filed March 1, 1971, Ser. No. 119,729
Int. Cl. B01d 35/00
U.S. Cl. 210—94 13 Claims

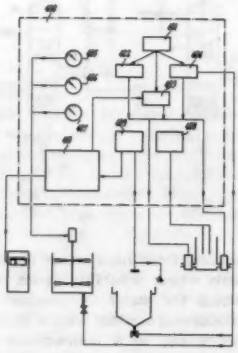


A device is provided for separating a biological fluid specimen into liquid and solid constituents for analysis. The illustrated device includes a receptacle for containing a quantity of the specimen in overlying relation to a filter in sheet form supported on a flat surface, and a vacuum source positioned beneath the filter to draw the liquid portion of the specimen through the filter while leaving the solid constituents on the upper surface of the filter for subsequent microscopic analysis.

3,731,807
APPARATUS FOR AUTOMATICALLY DETERMINING THE OPTIMUM AMOUNTS OF REAGENTS TO BE ADDED TO A LIQUID FOR ITS CLARIFICATION

Robert Louboutin, and Claude Daudenarde, both of La Celle, St. Cloud, France, assignors to Degremont Societe Generale Depuration et D', Saint Cloud, France

Filed July 7, 1970, Ser. No. 52,816
Claims priority, application France, Aug. 29, 1969, 6929571
Int. Cl. B01d 21/01
U.S. Cl. 210—96 10 Claims



Apparatus for automatically determining the optimum proportion of coagulant reagent to be added to a liquid in order to clarify same by coagulation of the substances in colloidal suspension therein, which comprises a plurality of mixing vessels into which predetermined quantities of liquid and reagent are introduced and in which these liquid and reagent are adapted to mix together, the resulting mixture being subsequently separated into a decanting fraction and a supernatant fraction, means for measuring the turbidity of said supernatant fraction, said means consisting advantageously of one

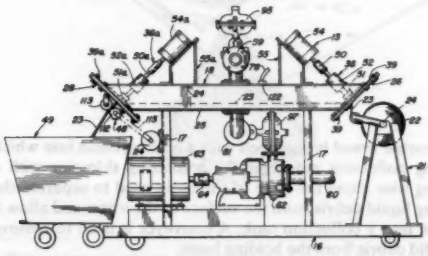
or a plurality of turbidimeters, and other means such as computer for analyzing and comparing the measurements made in said turbidimeter or turbidimeters, and determining the optimum proportion of reagent to be added to the liquid.

3,731,808

FILTER APPARATUS

Sherwood A. Rickert, 2559 North Monitor Avenue, Chicago, Ill.

Filed April 7, 1971, Ser. No. 131,932
Int. Cl. B01d *33/00*
U.S. Cl. 210—138 6 Claims



A filter apparatus for filtering solutions of various kinds and for various purposes including metal and like plating solutions including a filter housing having a web inlet opening and a web outlet opening through which a web of filter sheet material is drawn into the filter housing and the used sections thereof removed at intervals from the filter housing. Combination closure, sealing and web-clamping means or units are provided for cyclically opening and closing, sealing and clamping the web of filter sheet material in the web inlet and the web outlet openings of the filter housing. Means including an air pressure system embodying air-operated valves are provided for cyclically operating the combination closure, sealing and web-clamping means or units for the web inlet and web outlet openings of the filter housing.

The filter apparatus also includes means for cyclically pumping the filter solution into the filter housing and for removing the filtrate therefrom. The air pressure system includes air-operated valves for opening and closing the filter solution inlet in the filter housing and the filtrate outlet therefrom, and air pressure-responsive regulator switch means and an electronic timing switch means are provided for cyclically controlling the operation of the air valves for the web inlet and the web outlet openings in the filter housing and for cyclically controlling the operation of the air valves for the filter solution inlet and the filtrate outlet in the filter housing, and for other purposes.

A web of filter sheet material is provided having longitudinally spaced fluid-resistant areas or sections, which are resistant to filter solutions, for sealing the web inlet and web outlet openings in the filter housing during the filtering operation.

Means are provided for cyclically advancing the web of filter sheet material into and through the filter housing.

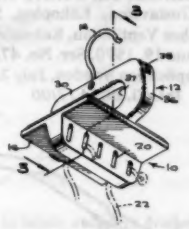
The apparatus also includes means for cyclically withdrawing unused filter solution from the filter housing at the end of each cycle of operations thereof and for withdrawing excess of filter solution from the web of filter sheet material at the end of each filtering operation and prior to the time when the used section of filter material is withdrawn from the filter housing and cut from the web of filter sheet material.

3,731,809

HANGER ASSEMBLY FOR SUPPORTING A PLURALITY OF CLOTHES HANGERS

Herman H. Saenger, Box 501, Fort Stockton, Tex.

Filed Aug. 25, 1971, Ser. No. 174,632
Int. Cl. A47g *25/06*
U.S. Cl. 211—118 6 Claims



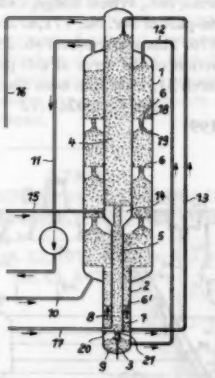
A clothes hanger of unitary plastic construction is disclosed in which a hanger bar having a plurality of hook receiving apertures is connected to a generally rectangular open interior handle along its top surface with a hook being provided in a slot in the top of the handle for pivotal movement between an upwardly extending position in which the hook can be positioned over a supporting bar and a retracted position in which the hook is completely received in the slot in the handle so as to enable an easy manual grasping of the handle by a user.

3,731,810

ION-EXCHANGER

Hugo Wallmuller, Essen-Ruttenscheid, Germany, assignor to GHH-M.A.N.-Technik Gesellschaft Fur Anlagenbau MbH, Essen, Germany

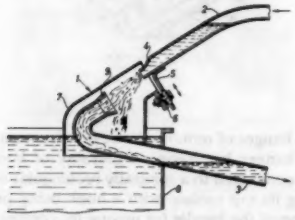
Filed May 6, 1971, Ser. No. 140,907
Claims priority, application Germany, May 15, 1970, P 20 25 035.5
Int. Cl. B01d *33/16*
U.S. Cl. 210—189 2 Claims



An ion-exchanger comprising an exchanger column, a regenerating column connected in series with said exchanger column, and a washing column connected downstream of the said regenerating column, the regenerating column and the washing column being arranged concentrically within the exchanger column and forming the inner wall of the exchanger column, feedlines connecting the said exchanger column to the said regenerating column and the said washing column to the said exchanger column, untreated water inlet and clean water outlet lines communicating with said exchanger column, regenerating medium inlet and outlet lines

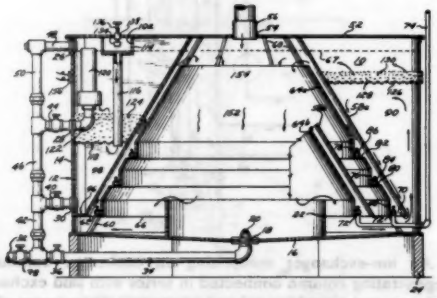
communicating with said regenerating column, and a washing water inlet line communicating with said washing column.

3,731,811
APPARATUS FOR ADJUSTING THE CONCENTRATION OF A CIRCULATING LIQUID SUSPENSION TO A DETERMINED, CONSTANT VALUE
Karl Axel Goran Gustavsson, Enkoping, Sweden, assignor to Aktiebolaget Bahco Ventilation, Enkolsing, Sweden
Filed June 19, 1970, Ser. No. 47,682
Claims priority, application Sweden, July 2, 1969, 9436/69
Int. Cl. B01d *17/00*
U.S. Cl. 210—194 **4 Claims**



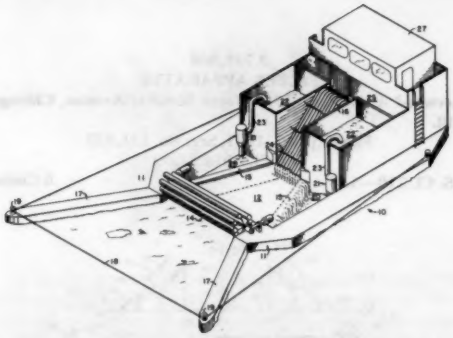
An apparatus for controlling the concentration of a circulating liquid suspension comprising a non-vertical nozzle and a funnel spaced therefrom in the direction of flow of liquid from the nozzle. Effluent having a concentration and viscosity above a predetermined value partially falls outside the funnel and effluent of the predetermined or lower concentration and viscosity is caught by the funnel to be recirculated. The critical value of the concentration and viscosity for the separation can be controlled by adjusting the angle of the nozzle or the spacing between it and the funnel.

3,731,812
DOMESTIC SEWAGE TREATMENT PLANT
James S. Stone, Wheat Ridge, Colo., assignor to Sanitary Disposal Systems, Inc., Wheat Ridge, Colo.
Continuation-in-part of Ser. No. 771,672, Oct. 29, 1968, Pat. No. 3,503,876. This application Feb. 25, 1970, Ser. No. 1,052. The portion of the term of this patent subsequent to March 31, 1987, has been disclaimed.
Int. Cl. C02c *1/12*
U.S. Cl. 210—199 **26 Claims**



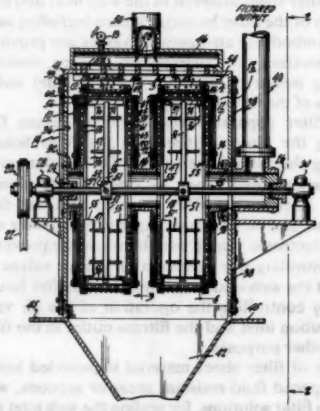
A tertiary treatment domestic sewage treatment plant effecting particle size reduction by hydraulic action, utilizing extended aeration and adiabatic cooling of the surface of the treating bath to enhance oxygen absorption and being provided with a living filter.

3,731,813
FLOATING DEBRIS RECOVERY APPARATUS
Robert R. Tipton, 249 El Caminito, Livermore, Calif.
Filed May 17, 1971, Ser. No. 143,910
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **9 Claims**



A marine vessel is equipped with a holding basin into which floating pollutants are urged by a rotating skimmer with a floating wier along the edge of the basin used to separate the floating liquid debris from the surface of the water and allow it to flow into a collection tank. A conveyor is used to remove the solid debris from the holding basin.

3,731,814
LIQUID FILTER
Theodore M. Walters, Milford, N.J., assignor to Charles H. Brown, New York, N.Y.
Continuation-in-part of Ser. No. 685,826, Nov. 27, 1967, Pat. No. 3,491,889. This application May 9, 1968, Ser. No. 727,842The portion of the term of this patent subsequent to Jan. 27, 1987, has been disclaimed.
Int. Cl. B01d *29/38*
U.S. Cl. 210—411 **17 Claims**



A clear liquid filter for removing solid particles from a liquid or slurry comprises a chamber having a filtration screen. A washer arm is positioned adjacent the interior surface of the chamber and is relatively movable in a direction parallel to the filter screen surface. The washer arm may comprise a rigid imperforate plate in the interior of the chamber and positioned rather close to but spaced from the screen. Various kinds of washer arms are disclosed. The construction of the washer arm in one or more forms is such that it scoops up the liquid within the chamber and pushes the scooped-up liquid against

the interior of the screen and outwards through the openings thereof as the relative motion of arm and screen continues. In another form, the washer arm is in the form of a tubular rotatable roller in direct contact with the interior surface of the chamber.

3,731,815

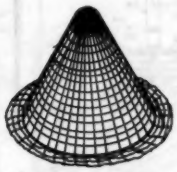
FILTER AND METHOD OF MANUFACTURE

George H. Collingwood, Hopewell; Robert C. Winckhofer, and Gene C. Weedon, both of Richmond, all of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 825,575, May 19, 1969, abandoned. This application April 26, 1972, Ser. No. 247,901

Int. Cl. B01d *39/10*

U.S. Cl. 210—496 14 Claims



Filters for petroleum based liquids and the like are manufactured from heat-treated fabric composed of filaments prepared from blended composite fibers. In general the filter is characterized by light weight, corrosion resistance, compatibility with petroleum based liquids, low cost, dimensional stability, and resistance to shock and other mechanical abuse.

3,731,816

SUBSTITUTED CELLULOSE IN GRAIN FORM AND A METHOD OF PRODUCING THE SAME

Ove Harald Edlund, Uppsala, Sweden, and Bjorn Arild Andreassen, Hovik, Norway, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Filed Aug. 6, 1971, Ser. No. 169,866

Claims priority, application Sweden, Aug. 6, 1970, 10834/70

Int. Cl. B01d *39/00*

U.S. Cl. 210—500 10 Claims

A substituted cellulose to be used as a separation medium in gel filtering processes in the form of substantially spherical grains containing 2 – 25 g of substituted cellulose per decilitre and having a pore size of generally between 2 to 2,000 μm, the cellulose containing as substituent ether bound uncharged groups, the substitution degree corresponding to a solubility of the substitution product in an 8 percent solution of sodium hydroxide in water (w/w) of at least about 1 percent (w/w) and to insolubility in water within the pH range of 11 – 1.

3,731,817

FISHING ROD HOLDER

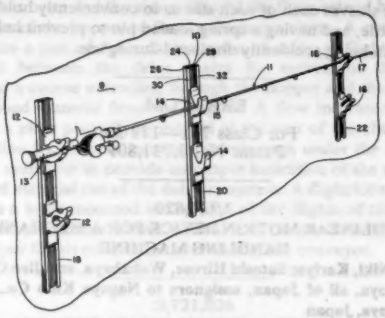
George V. Fowlkes, and Richard Eugene Fowlkes, both of Tulsa, Okla., assignors to Fo-Mac Enterprises, Inc., Tulsa, Okla.

Filed March 31, 1971, Ser. No. 129,855

Int. Cl. A47f *7/00*

U.S. Cl. 211—60 R 6 Claims

A fishing rod holder constructed primarily of weather resistant material, said material being flexible in either hot or cold weather, and particularly designed and constructed for the storage and protection of fishing equipment such as fishing



rods and the like, in boats, campers, trailers, automobiles, and the like.

3,731,818

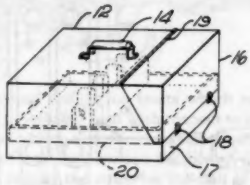
HOLDER FOR A PLURALITY OF WEAPONS

Jesse R. Young, 5302 West 138th Street, Hawthorne, Calif.

Filed Oct. 14, 1971, Ser. No. 189,275

Int. Cl. A47b *81/00*; A47f *7/00*

U.S. Cl. 206—16 R 10 Claims



A retaining support for a plurality of weapons is disclosed, which may be employed in a gun case. A centrally-mounted upright is affixed in a tray which is in turn received within the gun case. A pair of sets of rocker supports are disposed on opposed sides of the upright with resilient spacers therebetween and extending to receive and support guns at the barrel. A threaded shaft is affixed to the central upright and extends through both sets of rocker supports to provide studs which receive nuts for drawing the rocker supports together as to clamp guns therebetween.

3,731,819

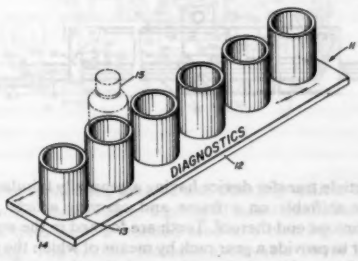
DIAGNOSTIC AGENTS STORAGE

Ellsworth Roland Sandhage, 9 Sandhage Drive, Pearl River, N.Y.

Filed Sept. 22, 1971, Ser. No. 182,610

Int. Cl. A47b *73/00*

U.S. Cl. 211—74 1 Claim



A storage rack adapted to hold a plurality of bottles of medical diagnostics, such as blood typing sera, consists of a

flat plastic base plate having in ordered configuration thereon and effectively integral therewith a plurality of cylindrical plastic sleeves each of such size as to conveniently hold a single bottle, and having a spring loaded pin to prevent held bottle from being accidently displaced during use.

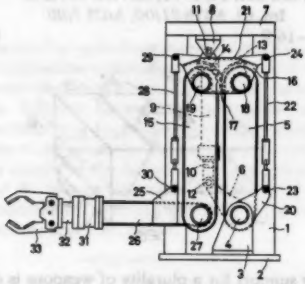
ERRATUM

For Class 211—118 see:
Patent No. 3,731,809

3,731,820
RECTILINEAR MOTION DEVICE FOR A MECHANICAL HANDLING MACHINE

Akiri Niki, Kariya; Satoshi Hirose, Wakabaya, and Jiro Ohara, Nagoya, all of Japan, assignors to Nagoya Kiko Co., Ltd., Negoya, Japan

Filed July 6, 1970, Ser. No. 52,396
Claims priority, application Japan, July 8, 1969, 44/53947; June 10, 1970, 45/50142
Int. Cl. B66c *1/42*
U.S. Cl. 214—1 BB 9 Claims

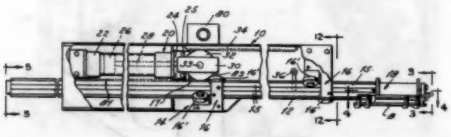


A rectilinear motion device which includes a mechanical arm having a pair of links or levers which extend and retract. The two levers are joined together at an elbow mechanism. The two levers extend at equal angles with respect to a reference line through the elbow mechanism. The ends of the two levers are respectively fixed with regard to the structure of the device and extensible to carry an arm which preferably maintains a planar position and which extends and retracts with the pair of levers.

3,731,821
ARTICLE TRANSFER DEVICE

Bernard J. Wallis, 25200 Trowbridge Avenue, Dearborn, Mich.

Filed Sept. 15, 1970, Ser. No. 72,399
Int. Cl. B66c *1/42*
U.S. Cl. 214—1 BB 1 Claim

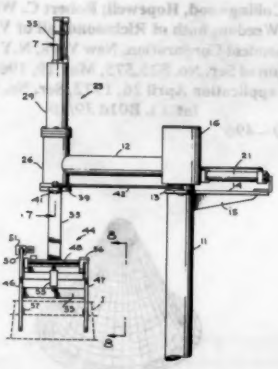


An article transfer device having a generally tubular-shaped member shiftable on a frame and carrying article gripping means on one end thereof. Teeth are formed in the wall of the member to provide a gear rack by means of which the member is shifted to an extended position such that the article gripping means is supported remotely from the frame in cantilever fashion.

3,731,822
FOUNDRY MOLD JACKET AND WEIGHT SHIFTER

Wilmer J. Friesen, and Frank A. Hulet, both of Hutchinson, Kans., assignors to M. W. Hartman Manufacturing Co. Inc., Hutchinson, Kans.

Filed Dec. 24, 1970, Ser. No. 101,363
Int. Cl. B66c *1/62*
U.S. Cl. 214—1 BC 3 Claims

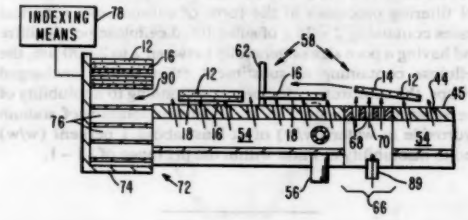


The shifting of the jackets and weights from the molds on one conveyor system run to a contiguous conveyor system run is performed automatically by a swinging boom mechanism having a vertical lift mechanism on the outer end of the boom. An open clamp means attached to the lower end of the lift rod closes the clamp on the jacket and accompanying weight of a mold in which the molten metal has solidified. The closed clamp and its load is lifted clear of the mold, swung on the supporting post through an angle to an aligned position over a fresh mold approaching the metal pouring station, after which the jacket and weight, held in the clamp assembly, is lowered over the green mold, set or snugged down on the mold, and the clamp is then opened, raised, swung back over the first conveyor run, and the cycle repeated. The operation is synchronous with the step-by-step movement of the mold pallets on the conveyor.

3,731,823
WAFER TRANSPORT SYSTEM

George R. Goth, Jericho, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1971, Ser. No. 148,371
Int. Cl. B65g *57/11*
U.S. Cl. 214—6 F 8 Claims



A transport system for semiconductor wafers and similar articles includes a transporter for the wafers, apparatus which introduces wafers to the transporter at one of its ends, a receiver for the wafers at the other end of the transporter, and apparatus for stacking two wafers during their passage along the transporter between the introducing apparatus and the receiver. The transporter is desirably an air slide, and a first wafer is stopped within the air slide by detaining pins that may be moved into the wafer path. A second wafer is then deflected by vertical air jets to lift it over the first wafer, where

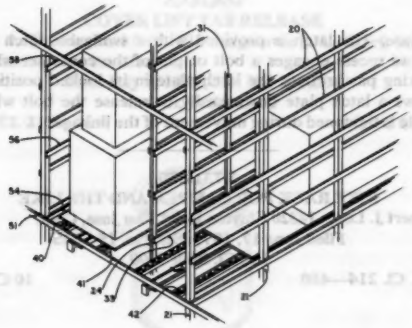
it is then stopped by the detaining pins and settles gently on top of the first wafer. If the air slide is bi-directional, the system may also include a wafer unstacker which receives the wafers from the receiver, then returns them to the introducing apparatus. This may be done with detaining pins of the same type used in the stacking apparatus and a Bernoulli pickup to restrain one of the wafers during unstacking. Such a system allows integrated circuit wafers to be stacked and unstacked without contacting a surface on each wafer in which the integrated circuits are being manufactured.

3,731,824

FOOD STORAGE AND HANDLING SYSTEM APPARATUS

Newel Howlett, 1401 Hillside Place, Las Vegas, Nev.

Filed Oct. 22, 1971, Ser. No. 191,947
Int. Cl. B65g *1/04*
U.S. Cl. 214—16 B **7 Claims**



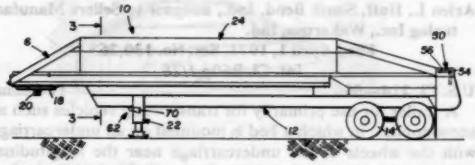
An improved apparatus and method for storing and handling articles and particularly refrigerated or frozen foods comprises a series of adjacent elongated storage compartments having rollers extending along the length of the bottom of each compartment on which rollers lie a row of flat plates which may be advanced along the rollers and on the upper surface of which plates materials are stacked. Plate advancing means are provided by a guided shaft extending substantially along the length of each compartment which shaft has attached thereto a series of catch members for contacting catch member receiving or stop means located on the underside of each of the plates; an operator advances the row of plates toward one end of the compartment by pulling the end of the shaft.

3,731,825

SELF-UNLOADING PARTICULATE MATERIAL DELIVERY SYSTEM

John H. Holland, and Gene O. Fox, both of Norman, Okla., assignors to Arkansas Rock and Gravel Co., Mufreesboro, Ark.

Filed Dec. 1, 1971, Ser. No. 203,740
Int. Cl. B60p *1/38*
U.S. Cl. 214—83.36 **12 Claims**



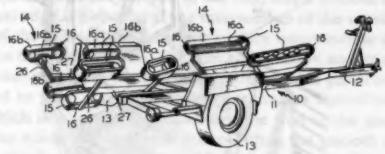
A self-unloading particulate material delivery system includes a material receiving hopper comprised of a front wall and side walls that slope inwardly and downwardly and a floor positioned beneath the lower ends of the walls. The rear of the hopper is open and the side walls and the floor extend beyond the rear of the hopper to form a discharge chute. A conveyor includes a pair of drive chains and a plurality of flights connected between the drive chains for movement thereby around a course extending through the hopper and the chute to unload material from the hopper. A flow indicator comprises a plate pivotally supported at the rear of the chute for actuation by material moving therethrough under the action of the conveyor to provide an output indicative of the rate of flow of material out of the delivery system. A flight locator includes a lever mounted in the path of the flights of the conveyor to provide an output indicative of the positioning of the conveyor flights relative to the course of the conveyor.

3,731,826

BOAT CRADLE FOR MOBILE TRAILERS

Lawrence N. Johnson, Route No. 1, Box 251A, Spokane, Wash.

Filed July 29, 1971, Ser. No. 167,186
Int. Cl. B60p *1/52, 3/10*
U.S. Cl. 214—84 **4 Claims**



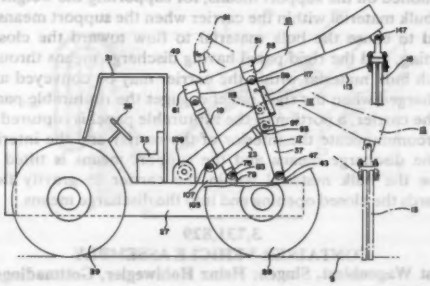
A trailer supported cradle for boats which minimizes the force required to mobilize a boat with respect to its trailer during loading and unloading activities and which substantially increases the area of contact between the boar hull and its supporting cradle to reduce the stress on the hull of the boat due to acceleration forces developed during transportation of the boat upon the tractor-drawn trailer, said support including elongated endless belts trained about articulately mounted sets of coplanar pulleys.

3,731,827

LOGGING MACHINE

Ronald S. Eaves, Louisville, Miss., assignor to Taylor Machine Works, Louisville, Miss.

Filed May 7, 1971, Ser. No. 141,263
Int. Cl. E02f *3/70*
U.S. Cl. 214—147 G **5 Claims**



A self-propelled log grapple and skidding vehicle for grappling the one end of one or a group of felled trees to skiddingly drag the trees from a wooded area to a clearing for further processing. The vehicle includes a movable boom having a grappling device depending therefrom and winching apparatus for snaking felled trees out of areas that are inaccessible to the vehicle. The boom is operably moved by hydraulic

lift and tilt cylinder devices which are positioned in such a manner that they are provided maximum protection, i.e., not susceptible to being damaged when the heavy trees supported by the grappling device inadvertently collide with the vehicle. A mounting support of a fair lead for the winching apparatus is included which will assure that the winch line load is not imposed on the boom or the lift cylinders.

3,731,828

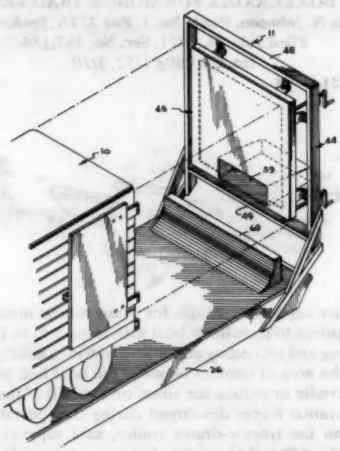
BULK MATERIAL HANDLING SYSTEM

Edwin E. Clarke, Allentown, and Albert J. Florig, Norristown, both of Pa., assignors to said Clarke, by said Florig

Filed Jan. 7, 1970, Ser. No. 1,078

Int. Cl. B65g *67/40*

U.S. Cl. 214—305 **11 Claims**



A bulk material handling system generally including a carrier for transporting bulk material, the carrier having an opening closed by a rupturable panel, means for supporting the carrier, means for tilting the support means to cause the bulk material within the carrier to gravity flow toward the closed opening when the carrier is positioned on the support means, a rigid upright frame structure mounted on the support means, a rigid panel mounted on the upright frame structure, movable into engagement with the rupturable panel when the carrier is positioned on the support means, for supporting the weight of the bulk material within the carrier when the support means is tilted to cause the bulk material to flow toward the closed opening, and the rigid panel having discharge means through which bulk material within the carrier may be conveyed and discharged when the rigid panel engages the rupturable panel on the carrier, a portion of the rupturable panel is ruptured to intercommunicate the interior of the carrier and the interior of the discharge means and the support means is tilted to cause the bulk material within the carrier to gravity flow towards the closed opening and into the discharge means.

3,731,829

CONTAINER-VEHICLE ASSEMBLY

Ernst Wagenblast, Singen; Heinz Hohlwegler, Gottmadingen, and Siegfried Schaible, Singen, all of Germany, assignors to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

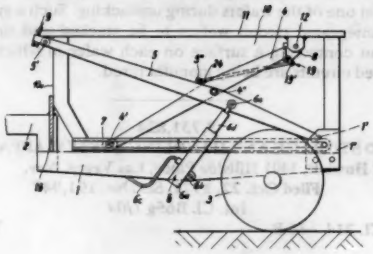
Filed Nov. 19, 1971, Ser. No. 200,329

Claims priority, application Germany, Nov. 23, 1970, P 20 57 567.1

Int. Cl. B65g *7/00*; B60p *1/64*

U.S. Cl. 214—390 **10 Claims**

A container-vehicle assembly in which a bifurcated trailer adapted to be towed by an agricultural vehicle of the like has, along the parallel shanks of the trailer body, a pair of vertically extendible and retractable scissor linkages adapted to support a container. A hydraulic drive raises and lowers the linkage and a simplified latch secures the container against undesired



release. The latch is provided with a swingable latch plate whose recess engages a bolt or pin of the container while a locking pawl retains the latch plate in its locked position or draws a latch plate downwardly to release the bolt when a cable is tightened during movement of the linkage.

3,731,830

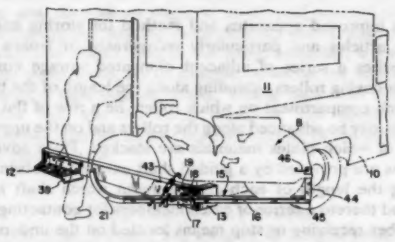
BIKE RACK FOR CAMPER AND THE LIKE

Robert J. Long, 14320 Clayton Road, San Jose, Calif.

Filed June 17, 1971, Ser. No. 154,045

Int. Cl. B60r *9/00*

U.S. Cl. 214—450 **10 Claims**



A rack for receiving and supporting a motorbike and the like on the body of a road vehicle in a manner for shiftability and angular swing relative thereto for enabling ingress and/or egress to and from the body of the vehicle without complete removal of the motor bike from the rack entailing a carrier longitudinally movable and balanceable relative to a hinged roller support, spaced from bridging means on the vehicle and including suitable locking means convertible to a ramp for use during unloading and loading of the motor bike relative to the rack.

3,731,831

TRAILER

Arlen L. Huff, South Bend, Ind., assignor to Sellers Manufacturing Inc., Wakarusa, Ind.

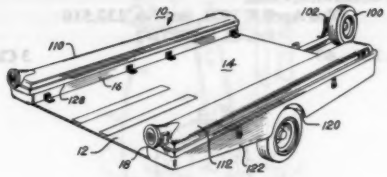
Filed April 1, 1971, Ser. No. 130,263

Int. Cl. B60p *1/28*

U.S. Cl. 214—506 **11 Claims**

A trailer for use primarily for transporting vehicles such as snowmobiles, in which a bed is mounted on an undercarriage with the wheels of the undercarriage near the longitudinal center and in which an opening is provided at the front and rear ends of the bed for unloading and loading a snowmobile. A draw bar is pivotedly connected to the underside of the bed and is adapted to swing laterally with respect to the bed to permit the bed to tilt both forwardly and rearwardly for unloading

and loading a vehicle. The wheels may be positioned laterally beyond the basic part of the bed, and a fender - compartment



combination having a longitudinal cover thereon is mounted over each of the two wheels.

3,731,832

COVER LIFT TAB RELEASE

John A. Foster, Rockford, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill.

Filed July 9, 1971, Ser. No. 161,236

Int. Cl. B65d *43/02*

U.S. Cl. 215—46 A **1 Claim**

To avoid bending of the free end portion of the sheet metal finger tab as it is swung upwardly to tear the skirt at upright score lines and release the cover as disclosed in U.S. Pat. No. 3,422,984, such end portion is formed with a center curl and separate curls inclined upwardly and outwardly from the ends of the center curl and along the side edges of the free end portion of the tab.

3,731,833

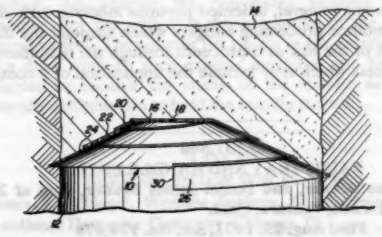
PLUG FOR BORE HOLES

Arnold Thomas Hyrve, 818 Manlewood Cresent, Calgary, Alberta, Canada

Filed Oct. 15, 1971, Ser. No. 189,718

Int. Cl. B65d *39/12*

U.S. Cl. 220—24.5 **8 Claims**



A plug for shot holes employed in seismic exploration in the form of a spiral sheet metal member with the convolutions slightly overlapping and shaped to define a frustro-conical member positioned in the shot hole with the largest convolution disposed below the central convolution.

3,731,834

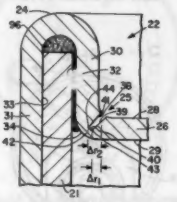
TEAR-OPEN CLOSURE

Charles D. Stuard, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed March 27, 1972, Ser. No. 238,217

Int. Cl. B65d *17/00*

U.S. Cl. 220—27 **9 Claims**



A substantially full opening tear-open closure for a container, the closure being of the type having an endless thin wall portion intermediate a removable panel and a residual rim. The outside surface of the thin wall portion is recessed from the adjacent outside surface of the rim, and a smooth endless residual edge is disposed at the intersection of the outside surface of the rim and the adjacent surface intermediate the rim and the thin wall portion. The thin wall portion and its endless junctures with both the rim and the removable panel are configured to form a predetermined continuous line-of-weakening which is wholly disposed nearer the wall of the container body to which the closure is secured than the smooth endless residual edge. Thus, upon tearing along the predetermined line-of-weakening to effect the removal of the removable panel, the raw edge formed thereby is also wholly under the residual rim whereby the raw edge is substantially precluded from being a cut hazard.

3,731,835

EASY OPENING CONTAINER

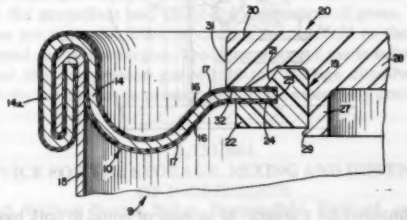
Jerry D. Hawkins, Country Club Hills, and Henry J. Keinanen, Hickory Hills, both of Cook, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 12,981, Feb. 20, 1970, abandoned.

This application Aug. 3, 1971, Ser. No. 168,726

Int. Cl. B65d *17/20*

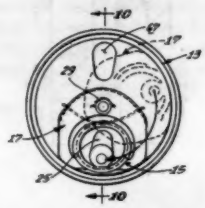
U.S. Cl. 220—53 **7 Claims**



A metal end unit for a container in which the metal end unit is formed with a pre-cut opening. A protective rim is bonded about the edge of the opening and a plastic sealing member overlies the opening and is separably bonded solely to the metal end unit by means of a thermo and pressure responsive bond promoting coating applied on the metal end unit.

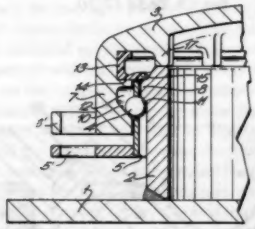
The plastic closure is bonded by means of R-F energy applied to induce heat in the metal end unit at the interface of said bond promoting coating and the plastic closure. Pressure is applied to form the desired bond.

3,731,836
CONTAINER WALL WITH CONNECTOR FOR RETAINING THE TAB AND TEAR PORTION ON THE CONTAINER WALL
Francis M. Silver, Dayton, Ohio, assignor to Ermal C. Fraze, Dayton, Ohio
Filed March 17, 1972, Ser. No. 235,710
Int. Cl. B65d 17/24
U.S. Cl. 220—54 17 Claims



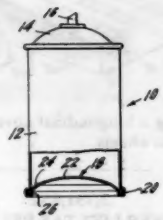
An easy opening container wall comprising a container wall of sheet material having a tear portion therein and a tab affixed to the tear portion for removing the tear portion to form an opening in the container wall. A connector attaches the tab to the container wall. The connector allows manipulation of the tab so that following removal of the tear portion from the container wall by the tab, the connector retains the tab and the tear portion on the container wall.

3,731,837
COVER PLATE
Douglas John Platts, Workshop, and Keith Ellis Hunter, Sheffield, both of England, assignors to General Descaling Company Limited, Nottinghamshire, England
Filed June 28, 1971, Ser. No. 157,111
Claims priority, application Great Britain, Dec. 11, 1970, 58,974/70
Int. Cl. B65d 45/00; E05c 19/00
U.S. Cl. 220—55 R 15 Claims



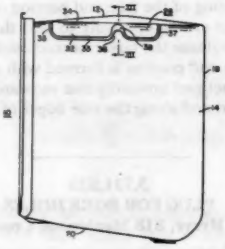
A container for transport or storage of liquid in bulk having a filling opening defined by an upstanding neck, the combination of a cover plate having a depending flange, by which the cover plate, when in position, is located on said neck, interlocking means for positively securing the cover plate to the neck including annular seating surfaces formed respectively on the neck and flange of the cover plate, a plurality of circumferentially arranged balls for operative engagement with said seating surfaces and by which the cover plate is positively held in position thereon, an annular cage encircling the neck and by means of which the balls are normally held in their operative position, the cage being capable of displacement by which the balls can be withdrawn from their operative position to a release position to permit removal of the cover plate.

3,731,838
CONTAINER END WALL CONSTRUCTION
Erik Gedde, Part Ridge, Ill., assignor to American Can Company, Greenwich, Conn.
Filed April 8, 1971, Ser. No. 132,518
Int. Cl. B65d 7/42
U.S. Cl. 220—67 3 Claims



Increased resistance against internal pressure in an end wall for a highly pressurized container is provided by an outwardly descending substantially planar portion at the periphery of a concavely domed central panel where the central panel meets a substantially vertical countersink wall.

3,731,839
DISHWASHING TANK HAVING INTEGRAL HANDLING MEANS
Olan L. Long, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed April 20, 1971, Ser. No. 135,643
Int. Cl. B65d 7/42
U.S. Cl. 220—74 7 Claims



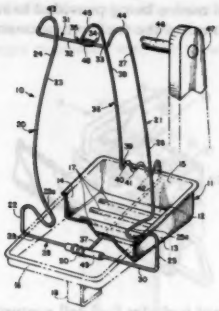
The invention provides a formed dishwasher tub or the like that includes integral, strengthening embossments situated and extending along the two top edges of the tub and with the same including integral, indented portions mediate their ends to accommodate processing hangers which suspend the dishwasher tub or the like as it proceeds through the manufacturing or process which may include the application of a coating material.

3,731,840
PAINT TRAY AND HANDLE UNIT
Elzy Alonzo Beutler, and Daniel James Beutler, both of 299 Drexel Avenue, Ventura, Calif.
Filed Aug. 25, 1971, Ser. No. 174,678
Int. Cl. B65d 25/28
U.S. Cl. 220—95 12 Claims

A generally upstanding handle is coupled to a paint tray for use in carrying and supporting the paint tray.

The handle, constructed in accordance with one embodiment of the invention, is an open wire framework having its top portion bent to constitute hooks by which the paint tray

can be suspended for storage purposes or during periods of usage by a painter.



The framework has plural resilient tongues and plural adjustable resilient loops for engaging portions of the paint tray in order to assist in stabilizing a chosen position of the tray.

3,731,841

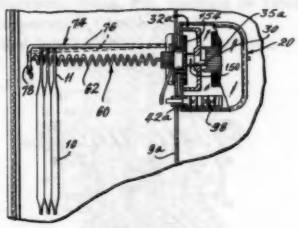
VENDING MACHINE WITH SCREW CONVEYOR TYPE CELLULAR MAGAZINE

Stanley O. Schlaf, Route 1, Winfield, Mo.

Continuation-in-part of Ser. No. 787,877, Dec. 30, 1968, Pat. No. 3,572,546. This application March 30, 1971, Ser. No. 129,488

Int. Cl. G07f 11/00

U.S. Cl. 221—75 **5 Claims**



A dispensing machine having article carrying spindles provided with thin mounting shanks which fit into sockets in drive shafts forming part of drive units. Each spindle shank has a tang which is engaged by a transversely extending pin in the drive shaft to which the spindle connects. The pins extend through the sockets and are adapted to shift laterally therein under spring bias so that the spindles can be detached for loading. An adapter for converting existing dispensing machines for use with thin-shank spindles of the aforementioned variety. The adapter fits rigidly in the enlarged sockets of a drive shaft on such existing machines and has a socket adapted to receive the shank of the spindle as well as a laterally shiftable pin to hold the spindle therein.

3,731,842

SEED SELECTOR FOR PLANTER

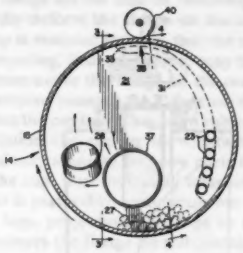
James E. Schlegel, Western Springs, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed April 29, 1971, Ser. No. 138,513

Int. Cl. B65g 29/00

U.S. Cl. 221—278 **16 Claims**

A seed selecting apparatus having rotatable seed selector drum with peripheral openings, an interior seed supply, air supplied under pressure to the interior selector of the drum to hold seed in the openings and carry the seeds upwardly to a discharge area and a discharge manifold designed to receive the seeds and discharge them through exit tubes. Air flow into



the discharge manifold assists in dislodging the seed and ejecting it through the exit tubes.

3,731,843

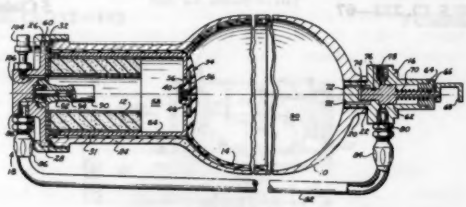
GAS SOURCE

Carl W. Anderson, Jr., Springfield, Va., assignor to The Susquehanna Corporation, Alexandria, Va.

Filed June 10, 1971, Ser. No. 151,661

Int. Cl. B67d 7/24

U.S. Cl. 222—3 **9 Claims**



An embodiment of the gas source is disclosed which uses a compressed gas cylinder whose interior is divided into two chambers by a folded bladder. One chamber is a storage chamber for the compressed gas and the other is a combustion chamber for housing and burning a solid propellant. When the discharge valve is opened, a gas pressure pulse is applied from the storage chamber to a pressure-responsive spring in the propellant ignition system. The ignition system functions to ignite the propellant and cause the generation of gases. These gases act upon the bladder causing it to unfold as the compressed gas is discharged. The generation of gas is tailored to cause the compressed gas within the storage chamber and thereby the discharge pressure to remain essentially constant.

3,731,844

DEVICE FOR THE STORAGE, MIXING AND DISPENSING OF INGREDIENTS

Hugh William Barnes Baker, Beaconsfield, England, assignor to The Gillette Company, Boston, Mass.

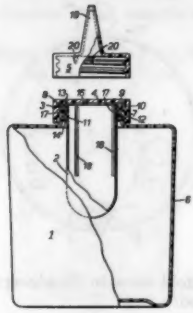
Filed March 22, 1971, Ser. No. 126,582

Int. Cl. B67b 7/26

U.S. Cl. 222—83 **6 Claims**

A device for the storage, mixing and dispensing of two ingredients which comprises two containers nested in spaced relationship one within the other, each container having a mouth, a collar within the mouth of the outer container, means for releasably supporting the inner container within the collar with the mouths of the two containers substantially coplanar, a rupturable closure extending across and sealingly engaging the mouth of the inner container, and means engageable with the device for rupturing the closure to open the

mouth of the inner container and releasing the supporting means to permit the inner container to move within the outer



container so that the contents of the two containers can be mixed by shaking the device.

3,731,845

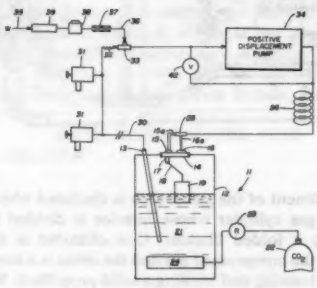
SYSTEM FOR DISPENSING CHILLED CARBONATED WATER

Jack J. Booth, P.O. Box 507, Carrollton, Tex.

Filed Nov. 23, 1970, Ser. No. 91,873

Int. Cl. B67d *5/08*

U.S. Cl. 222—67 **5 Claims**



A carbonation unit in a closed loop including a circulation pump, dispensing valves, a restrictor and a pressure regulated source of fresh makeup water with a float contolled inlet to the carbonation unit, which is normally restricted as carbonated water within the unit approaches a predetermined level. A bypass valve across the pump is open o recirculate water within the pump when the carbonation unit inlet becomes restricted. Water withdrawal from the carbonator through the dispenser valves opens the inlet for increased flow to the carbonator accompanied by a pressure drop to close the pump bypass valve. Pump suction drops the pressure across the restrictor to draw makeup water into the loop.

3,731,846

FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINE POWERED PORTABLE TOOLS AND THE LIKE

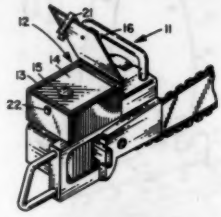
William A. Turner, 205 Sycamore Road, and John J. Forrer, Jr., 200 Sycamore Road, both of Franklin, Va.

Filed July 16, 1971, Ser. No. 163,252

Int. Cl. B67b *7/24, 9/00*

U.S. Cl. 222—86 **8 Claims**

A fuel system for a portable tool or the like powered by an internal combustion engine including a fuel compartment mounted thereon into which a fuel cell containing a supply of the proper fuel for such an engine may be downwardly moved. A cover element for the fuel compartment may be swung upwardly about a hinge line to permit the fuel cell to be positioned therein and then swung downwardly to be secured in a closed position; seal means being provided to substantially assure the liquid tightness of the fuel compartment when closed.



The fuel compartment includes fuel cell rupturing or puncturing devices mounted therein in an upwardly extending position for penetrating the fuel cell as it is moved downwardly into the fuel compartment to permit fuel to flow therefrom into a fuel conduit extending from the lower portion of the fuel compartment towards the engine.

3,731,847

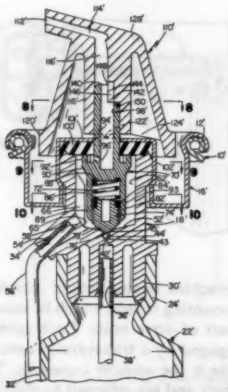
PLURAL COMPARTMENT PRESSURIZED DISPENSING PACKAGE

Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 778,689, Nov. 25, 1968, abandoned. This application June 1, 1971, Ser. No. 148,498

Int. Cl. B65d *35/22*

U.S. Cl. 222—94 **2 Claims**



A pressurized dispensing package has a self-supporting flexible walled inner container disposed within and seated on the base of a rigid walled outer container. A valve assembly controls mixing of materials stored in the containers and flow of that mixture to the atmosphere. Dip tubes secured to the valve assembly extend to the bottom of each container. The outer container is charged with propellant through the valve stem of the valve assembly. An actuator cap on the stem is pivoted about a tilt axis to open two valves and discharge a mixture.

3,731,848

COMPARTMENTALIZED CONTAINER

Shouichi Nakanishi, Amagasaki, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

Filed March 2, 1971, Ser. No. 120,203

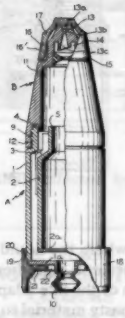
Claims priority, application Japan, April 3, 1970, 45/32187

Int. Cl. B67d *5/56*

U.S. Cl. 222—129 **6 Claims**

This invention relates to a compartmentalized container for preservation, mixing and distribution of a plurality of incom-

patible liquid chemicals or medicaments which must be segregated prior to use. The container has a composite container body consisting of a larger open-topped container having an elastic airchamber extending from the bottom thereof and a smaller open-topped container inserted into an firmly held in said larger container with the mouth thereof approxi-



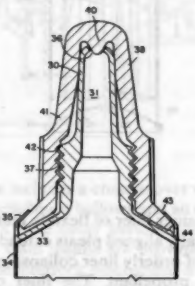
mately in a common plane with the mouth of said larger container. A detachable cap closes the above mouth-plane. A pouring nozzle body having a nozzle head at its top, a reservoir and a hollow mixing space therewithin is detachably connectable to the composite container so as to cover its common mouth-plane in place of the above cap.

3,731,849

CONTAINER AND CAP COMBINATION TO INDICATE TAMPERING

Frederick J. Burrows, Aston, Pa., assignor to Teledyne Mid-American Corporation, Chester, Pa.

Filed July 23, 1971, Ser. No. 165,566
Int. Cl. B67b *3/26*
U.S. Cl. 222—153 **6 Claims**



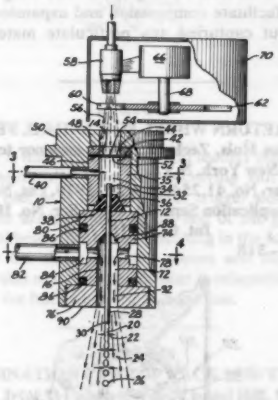
A container and cap combination which indicates tampering if the cap is removed from the container, and then restored to its initial position on the container. The container has a tip which is adapted to be used to discharge its contents and which may be externally threaded. The tip connects with the shoulder on the forward end of the container and the shoulder connects with the side wall of the container, which, at least in the case of a collapsible tube, is initially open at the lower end but is subsequently filled with contents and closed. From the shoulder there extends a flange in the same direction as the tip and around the tip. The cap, which may be made of pliable plastic such as polyethylene, polypropylene or the like or of other materials such as metals, has an end wall adapted to close the opening of the tip, side walls connected to the end wall which may have internal threads to engage threads on the tip, and an outwardly extending flange which is smaller in diameter than and within the flange on the container, the flange on the container being inwardly flared over the outer edge of the flange on the cap. In removing the cap, the cap may outwardly deform the flange on the container and thus when the cap is restored indicate that the tube has been subjected to tampering. Instead, the cap may be so pliable that it will spring from under the flange on the container and be impossible to restore beneath the flange on the container, thus indicating that the container has been subject to tampering. In another variation the cap or the container flange may be frangible and may separate into two parts if an effort is made to remove the cap, thus indicating tampering. The flange on the container is preferably continuous, but it may consist of a plurality of lugs, projections, scallops or the like. While in smaller containers the flange on the container will preferably be of the same diameter as the side wall, in larger containers the flange on the container will preferably be of a smaller diameter than the side wall of the container. In the preferred embodiment the flange on the cap is provided with a sloping diagonal edge at its outer corner adjacent the shoulder of the container, to aid it in deforming any bent portion of the flange on the container outwardly in inserting the cap.

3,731,850

DROPLET GENERATOR AND METHOD

William H. Weitzel, San Diego, and Lee D. LaGrange, Del Mar, both of Calif., assignors to Gulf Oil Corporation, San Diego, Calif.

Filed Jan. 14, 1972, Ser. No. 217,853
Int. Cl. B01d *47/02*
U.S. Cl. 222—193 **7 Claims**



A droplet generator and method for dispersing a liquid feed stock into uniform spherical droplets. The apparatus includes means for providing a jetstream of the liquid feed stock, means for generating uniformly periodic varicose instabilities in the jetstream, and means for providing a concurrent, coaxial flow of gas surrounding the jetstream in order to enhance the varicose instabilities in order to cause the uniform dispersion of the jetstream into uniform spherical droplets. It is desirable that the varicose instabilities have a wavelength of at least π times the unperturbed diameter of the jetstream.

3,731,851

PARTICULATE MATERIAL DISPENSER

James Rauh, Union City, N.J., assignor to Milton R. Stanson, New York, N.Y. and James Rauh, Union City, N.J., part interest to each

Continuation of Ser. No. 796,760, Feb. 5, 1969, abandoned.
This application Feb. 26, 1971, Ser. No. 119,302
Int. Cl. B65d *83/06*
U.S. Cl. 222—213 **7 Claims**

A particulate material dispenser from which a metered amount of particulate material can be discharged. The

dispenser includes a flexible resilient container having a bottom end provided with a tubular neck portion forming a discharge opening for the container. A plug at the tubular neck portion has an outer closure end normally closing the container and an inner closure end also closing the container when the latter is compressed to discharge material, the plug being formed with an annular groove between its outer and inner closure ends so that this groove which normally communicates with the interior of the container will determine the amount of material discharged therefrom when the inner closure end of the plug is displaced into the tubular neck portion.

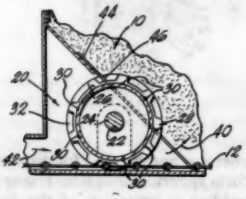
The plug is connected with a stem which extends axially along the interior of the container to the top end thereof where the stem is fixed with the container so that when the top end of the container is displaced toward the bottom end thereof the plug will be shifted to discharge material from the container. A base is connected either with the tubular neck portion or with the plug itself to provide a support for the container. The container wall is formed with grooves and ridges which are designed to facilitate compression and expansion of the container without capturing any particulate material in these grooves.

3,731,852

FEED RETURN WHEEL FOR ANIMAL FEEDERS

Robert L. Van Huis, Zeeland, Mich., assignor to U. S. Industries, Inc., New York, N.Y.

Division of Ser. No. 41,254, May 28, 1970, Pat. No. 3,656,158.
This application Sept. 22, 1971, Ser. No. 182,903
Int. Cl. G01f *11/06*
U.S. Cl. 222—318 **18 Claims**



A feed return wheel having a feed compacting surface and a chain-engaging sprocket, the sprocket being formed integrally with the surface and the surface being provided with spaced raised protrusions for positively engaging returned feed to cause the latter to mix with fresh feed.

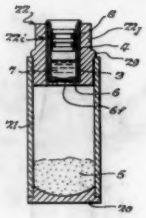
3,731,853

MULTI-CHAMBER RECEPTACLE

Erwin Baumann, Nendeln, and Gerhard Beham, Lettstrasse 789, Vaduz, both of Liechtenstein

Filed July 27, 1970, Ser. No. 58,572
Claims priority, application Germany, Aug. 1, 1969, P 19 39 315.8
Int. Cl. A61k *5/00*
U.S. Cl. 222—386 **7 Claims**

A multi-chamber receptacle for storing and mixing the ingredients of products such as dental preparations, including a chamber in a casing for storing liquid or pasty material and a piston for closing the chamber during initial storage and for then expelling the material from the chamber into a main



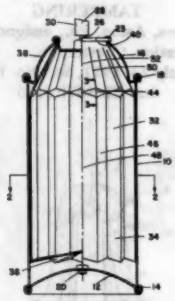
chamber in a container where the liquid or pasty material will be mixed with a pulverulent ingredient. The casing has a frangible bottom portion or the like adapted to be ruptured for transfer of the liquid or pasty material to the main chamber.

3,731,854

COLLAPSIBLE CONTAINER LINER

Don E. Casey, 645 Nell Avenue, Columbus, Ohio

Filed July 12, 1971, Ser. No. 161,840
Int. Cl. G01f *11/00*
U.S. Cl. 222—386.5 **11 Claims**



An aerosol container liner of flexible material having a plurality of longitudinally aligned pleats extending inwardly in the general direction of orderly liner collapse under the influence of a surrounding propellant. The liner comprises longitudinally arranged tiers of pleats joined by foldable, intermediate, hinge portions blending the adjoining pleats.

3,731,855

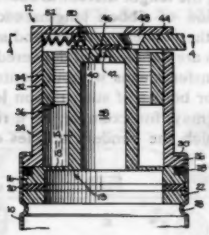
PRESSURIZED CONTAINERS

Kenneth D. Vos, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed June 30, 1971, Ser. No. 158,194
Int. Cl. B65d *83/14*
U.S. Cl. 222—394 **11 Claims**

This invention relates to a pressurized package of the class which includes a container for receiving a product, propellant means in the container for discharging the product from the container, and a dispensing assembly mounted on the con-

tainer which is characterized by an actuating lever that shifts laterally for unsealing a slide valve against which sealing is

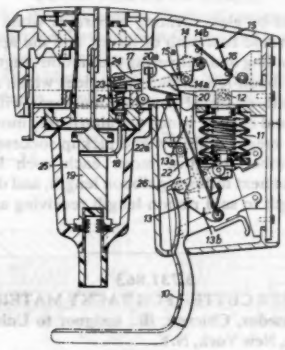


normally at least partially effected by the internal container pressure.

3,731,856
LIQUID METERING DEVICE WITH TIME DELAYED CLOSURE

Robert William Young, Battledown, England, assignor to Autic Developments Limited, Cheltenham, England

Filed Jan. 3, 1972, Ser. No. 214,966
Claims priority, application Great Britain, Nov. 1, 1971, 50,645/71
Int. Cl. B65d *47/28*
U.S. Cl. 222—477 **6 Claims**



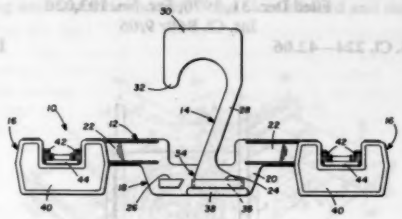
A liquid measure includes a change-over valve and an interlock mechanism including a bellows and an over-centre spring acting to provide a time delay between change-over operations of the valve. Cam means are provided whereby movement of a part of the interlock mechanism is not transmitted to the over-centre spring until a change-over condition is reached.

3,731,857
GARMENT HANGER

Edmond R. Haggar, Dallas, Tex., assignor to Haggar Company, Dallas, Tex.

Filed April 6, 1971, Ser. No. 131,597
Int. Cl. A47j *51/098, 51/14*
U.S. Cl. 223—96 **11 Claims**

In a garment hanger, a hanger hook is supported on a hanger body for movement between extended and retracted positions. The hanger body includes gripping members for receiving a garment and has shank and tip receiving slots formed in it. The hanger hook includes a shank that is slidably supported in the shank receiving slot and a member at one end of the shank for selective engagement with the shank receiving slot to secure the hanger hook in the extended position. A support extends laterally from the other end of the shank, and a tip extends from the support for selective engagement with the



tip receiving aperture to secure the hanger hook in the retracted position.

3,731,858
GUN HOLSTER

Roy L. Baker, 2729 Cannon Street, Rockford, Ill.

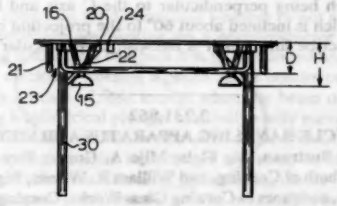
Filed May 28, 1971, Ser. No. 147,862
Int. Cl. F41b *13/04*
U.S. Cl. 224—2 B **16 Claims**

The holster is made of two identical leather pieces joined in overlying relationship. One belt receiving slot is provided through both pieces at the bottom or trigger side of the gun; while two slots are provided at the top of the gun, one slot being at a level below the other. Stitching in the form of closed loops around the slots joins the pieces and forms the gun pocket. With this structure the holster is adaptable for regular or cross-draw for both right or left-hand use.

3,731,859
COMBINATION CAR TOP RACK AND TABLE

Carl N. Bean, Jr., 133 Celeste Circle, Chapel Hill, N.C.

Filed Nov. 15, 1971, Ser. No. 198,670
Int. Cl. B60m *9/04*
U.S. Cl. 224—42.01 **1 Claim**



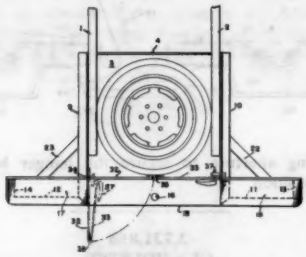
A combination car top rack and table supports and secures luggage or other gear in transit and converts to a table when not in transit. A plurality of side rail members adjust to various positions useful both as part of a car rack and a table.

3,731,860

CAMPER-BUMPER COMPARTMENT AND STEP

Arlyn W. Davis, Rt. No. 2, P.O. Box 228, Sheridan, Oreg.

Filed Dec. 31, 1970, Ser. No. 103,030
Int. Cl. B60r *9/06*
U.S. Cl. 224—42.06 **1 Claim**



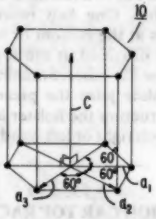
A spare tire mount for a vehicle having a chassis including a pair of longitudinal frame members of channel section. The tire mount is of box-like formation incorporated in the vehicle structure in a manner which adds to the utility of the vehicle, protects the same from damage liable to be sustained by accidental collision with a following vehicle, and which provides means for carrying extra tires, tools, baggage and the like, which are also protected by the box-like structure.

3,731,861

METHOD FOR DICING MATERIALS HAVING A HEXAGONAL CRYSTAL STRUCTURE

Robert Edward Busch, Elizabeth, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1971, Ser. No. 193,529
Int. Cl. B26f *3/00*
U.S. Cl. 225—2 **2 Claims**



A method for dicing materials having a hexagonal crystal structure, in which the C axis of the crystal is oriented parallel to one surface. Two scribe lines are made on the one surface, each perpendicular to the other and one being perpendicular to the C axis. Two additional lines are scribed on the back surface, each being perpendicular to the C axis and lying in a plane which is inclined about 60° to the projection of the one surface scribe line which is likewise perpendicular to the C axis.

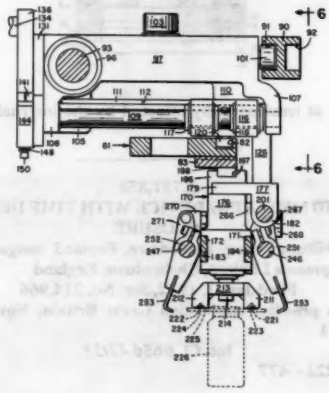
3,731,862

ARTICLE HANDLING APPARATUS AND METHOD

Daniel J. Bustraan, Big Flats; Miljo A. Gossic; Roy N. Sundstrom, both of Corning, and William R. Wisner, Big Flats, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 82,466, Oct. 20, 1970, Pat. No. 3,690,527
Filed May 15, 1972, Ser. No. 253,628
Int. Cl. B26f *3/00*
U.S. Cl. 225—4 **6 Claims**

A substantially continuous ribbon of a thermoplastic material supporting a plurality of depending and equally spaced-apart articles or bodies and moving in a generally linear direction through a first path of travel at a relatively high rate of speed is periodically fractured at equally spaced-apart points along the length thereof to successively provide a series or succession of ribbon lengths each supporting an equal number of the pendent articles, and successive ones of the ribbon lengths are handled and delivered to ribbon-length receiving and transfer means without contacting any of the pendent articles or bodies of such ribbon lengths. The thermoplastic ribbon may, for example, be a ribbon of a glassy material from which the pendent articles or bodies are integrally formed by glass forming apparatus while the ribbon moves through said first path of travel, and the apparatus for fracturing, handling and delivering the ribbon lengths includes a plurality of ribbon-length pickup devices which are located in a second path of travel generally collinear with said first path of travel and each of which are alternately moved and actuated by cam means to follow and pickup successive ones of the moving ribbon lengths, move each such length into clearance of the next following ribbon length, and deliver each picked-up length to said ribbon-length receiving and transfer means.

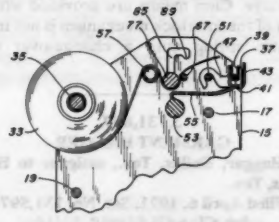


3,731,863

DISPENSER CUTTER FOR TACKY MATERIALS

Joseph A. Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,900
Int. Cl. B26f *3/02*
U.S. Cl. 225—20 **7 Claims**



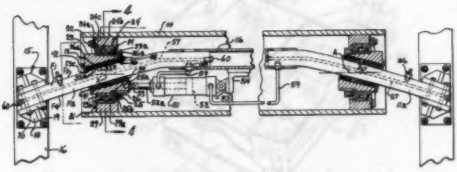
A dispenser cutter for rolled fabric materials, particularly tacky materials such as wax impregnated paper, which includes a cutting blade, guard means to shield the cutting blade in its non-operative position and a combination of roller means to direct movement of the rolled fabric material into severing engagement with the cutting blade, to free a leader of the rolled fabric material from the cutting blade and to restrain the freed leader against retraction.

3,731,864

WEB GUIDE ROLLER ASSEMBLY

Robert W. Ott, Jr., Rockford, Ill., assignor to Rockford Servo Corporation, Rockford, Ill.

Filed Aug. 13, 1971, Ser. No. 171,573
Int. Cl. B65h 25/26
U.S. Cl. 226—19 11 Claims



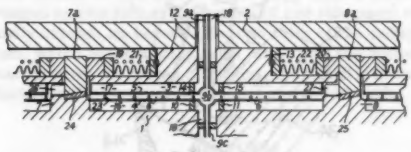
A web guide roller assembly for guiding a traveling web in which the web guide roller is rotatably mounted on followers located internally of the roller, the followers defining a guide bearing slidably and nonrotatably engaging longitudinally arcuate portions of a guide bar that extends through the roller to thereby support the roller for longitudinal shifting and tilting movement relative to the path of web travel. An operator for longitudinally shifting the roller relative to the guide bar is advantageously located internally of the roller and operatively connected to the guide bar and one of the followers.

3,731,865

FLUID TRANSFER MEANS

Michael Burke Wood, Fossway, England, assignor to International Research & Development Company Limited, Fossway, Newcastle upon Tyne, England

Filed March 1, 1971, Ser. No. 119,789
Claims priority, application Great Britain, Feb. 27, 1970, 9,717/70
Int. Cl. H02k 9/00
U.S. Cl. 277—15 5 Claims



A rotary seal assembly for transfer of cryogenic fluid to a rotor in which the fluid passes from a port in a stationary vacuum-insulated wall to a port in a rotating vacuum-insulated wall by way of an annular space between the walls which is closed by rotary seals at its ends remote from the ports and is shaped to minimize flow from the ports to the seals so that the seals can operate at ambient temperature.

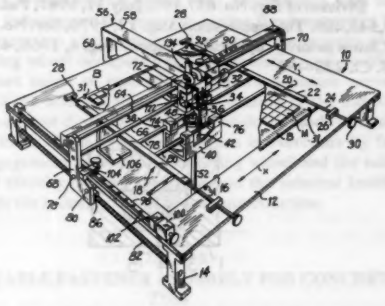
3,731,866

APPARATUS FOR REMOVING AND REPLACING MULTI-PINNED COMPONENTS MOUNTED ON CIRCUIT BOARDS

Roger S. Mason, Poughkeepsie, and George R. Pullis, Fishkill, both of N.Y., assignors to Cogar Corporation, Wappingers Falls, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,645
Int. Cl. B23k 1/00
U.S. Cl. 228—6 11 Claims

An apparatus for removing a selected electrical component soldered into a circuit board and replacing such component with another component is provided and includes a frame plate on which the circuit board is mounted. A head assembly is positionable over the component to be removed and replaced, and this assembly carries a pair of heads, namely a component pickup head and a component insertion head. A soldering unit is positioned below the circuit board and shifts



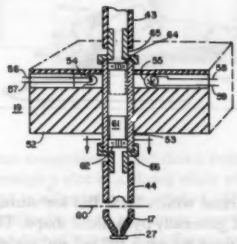
with the head assembly. The soldering unit liquifies the solder holding the selected component in place, the pickup head removes the component from the board, the insertion head puts a new component in its place, and the soldering unit solders it into the circuit board.

3,731,867

VACUUM DIE SENSOR APPARATUS AND METHOD FOR A SEMICONDUCTOR DIE BONDING MACHINE

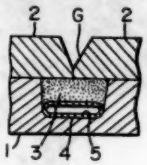
Milo W. Frisbie; Frank E. Polka, and Philip Vaught, all of Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed July 19, 1971, Ser. No. 163,920
Int. Cl. B23k 1/00
U.S. Cl. 228—6 9 Claims



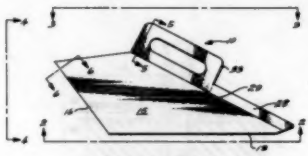
Sensing apparatus for determining whether or not a vacuum pickup mechanism for picking up a semiconductor die and transferring it to a lead to which it is to be bonded has picked up a die is disclosed wherein a photo cell is continuously illuminated by a beam of light except when the beam of light is blocked by a cylindrical plunger relatively easily movable in a glass tube. When no die has been picked up, and vacuum is applied at the sensing point the plunger moves up to block the light beam. Under this influence the indexing motor for moving the lead upon which the die is to be mounted is prevented from starting, and the lead frame remains stationary until a die is deposited. When a die has been picked up, the sensing vacuum is applied but is ineffective because the plunger remains down, after an upward transient, and through appropriate circuitry the indexing motor moves the lead frame along in the normal manner.

3,731,868
ONE-SIDE BACK BEAD FORMING BUTT-WELDING PROCESS USING A THERMOSETTING BACKING COMPOSITE
Masayasu Arikawa, and Katsuro Iio, both of Fujisawa, Japan, assignors to Kobe Steel Ltd., Kobe, Japan
Division of Ser. No. 657,197, July 31, 1967, Pat. No. 3,548,489. This application Aug. 13, 1970, Ser. No. 63,643
Claims priority, application Japan, Aug. 4, 1966, 41/51391
U.S. Cl. 228—50 **2 Claims**



A powdery backing composition for use in a one-side back-bead-forming butt-welding process wherein a powdery backing composition is applied against the underside of the groove between workpieces to be welded together and said workpieces are butt-welded on the upperside of said groove, said backing composition including thermosetting resin powder, iron powder, and slag forming agent and having been initially agglomerated by the melting of said resin powder prior to the welding operation.

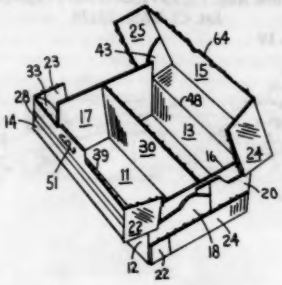
3,731,869
DISPOSABLE CONTAINER
Nicholas E. Griffin, 881 South Grand Avenue, Pasadena, Calif.
Filed July 2, 1971, Ser. No. 159,433
Int. Cl. B65d *5/00*
U.S. Cl. 229—22 **2 Claims**



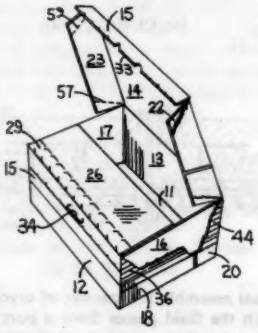
A collapsible urinal which folds flat for storage, and erects into a container of generally pyramidal shape. The container is made from a flat blank which is folded and sealed such that no interior fluid traps are formed and so all raw unsealed edges of the blank are outwardly facing to prevent fluid absorption along these edges. The container is easily emptied and rinsed, and can be reused several times before disposal.

3,731,870
COMPARTMENTED ICE CREAM CARTON WITH INTERIOR VERTICAL SUPPORT AND DIVIDER, DUAL OPENING MEANS AND RECLOSURE MEANS
Kenneth T. Buttery, Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.
Filed May 3, 1971, Ser. No. 139,720
Int. Cl. B65d *5/48*
U.S. Cl. 229—27 **16 Claims**

A top-opening, rectangular paperboard carton including top, bottom, front wall, rear wall, and end wall panels which together define an enclosure and the top panel of which comprises two members hinged, respectively, to the front wall panel and the rear wall panel. A detachable vertical divider panel separates the enclosure into a plurality of compartments and the top panel members provide separate access means to such compartments.



3,731,871
COMPARTMENT FRONT OPENING CARTON WITH INTERIOR VERTICAL DIVIDER AND SUPPORT
Kenneth T. Buttery, Kalamazoo, and Richard G. Haas, Parchment, both of Mich., assignors to Brown Company, Kalamazoo, Mich.
Filed May 3, 1971, Ser. No. 139,658
Int. Cl. B65d *5/48*
U.S. Cl. 229—27 **10 Claims**

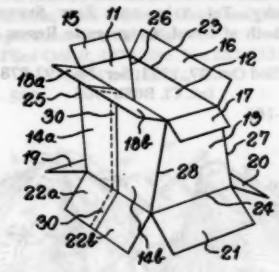


A front-opening, rectangular paperboard carton including top, bottom, front wall, rear wall and end walls, which together define an enclosure and an upstanding divider separating the enclosure into a plurality of compartments. At least one compartment is provided with a removable cover panel.

3,731,872
FOUR-SIDED TAPER BOX
Robert W. McCormick, W. Palm Beach, Fla., assignor to Union Camp Corporation, Township of Wayne, N.J.
Filed May 14, 1971, Ser. No. 143,396
Int. Cl. B65d *5/02*
U.S. Cl. 229—37 R **3 Claims**

A four-sided box having two opposite side panels tapered in

one direction, and the other two opposite side panels tapered



in the opposite direction, which box is formed from a substantially rectangular blank.

3,731,873

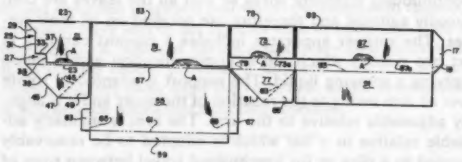
QUICK-ERECT CARTON

Edward J. Brangle, Jr., 7054 Amherst Avenue, University City, Mo.

Filed Jan. 19, 1972, Ser. No. 219,080

Int. Cl. B65d *5/36, 5/02*

U.S. Cl. 229—41 **4 Claims**



A quick-erect carton supplied in a collapsed condition in flattened two-sided form with one end and one side panel constituting one side and another end and another side panel constituting the other side, adapted to be erected by opening it up to rectangular form with the end panels at the ends and the side panels at the sides thereof, and with a bottom panel hinged on one side at the bottom of one side panel which initially extends up between the two sides of the collapsed carton, which automatically folds down into the bottom of the carton when the carton is opened, and which is automatically locked at its side opposite its hinge and at both ends.

3,731,874

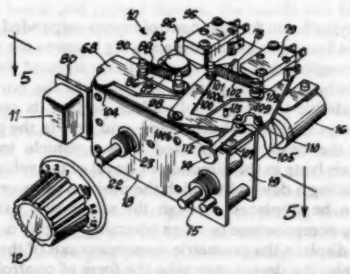
COMBINATION COUNT-DOWN COUNTER AND RESET COUNTER FOR A DUPLICATING MACHINE OR THE LIKE

Wallace R. Fowlie, North Riverside, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed June 29, 1971, Ser. No. 158,026

Int. Cl. G06m *3/02*

U.S. Cl. 235—91 R **14 Claims**



Manual operation of a quantity selector knob rotates a selector wheel carrying a stop thereon. An indexing wheel is mounted in adjacent coaxial relationship with the selector wheel and is indexed in one rotary direction in response to cyclical operation of a component of a duplicating machine. The indexing wheel carries a formation for abutting engagement with said stop. Biasing means engage the indexing wheel for urging the latter in a direction opposite said one direction thereby to bring said formation into engagement with said stop. The indexing wheel operates means for deactuating the cyclical operation of the aforesaid machine component when the indexing wheel occupies a predetermined rotary position. In the reset mode of operation, restraining means prevent rotation of the selector wheel during rotation of the indexing wheel in said one direction; in the count-down mode of operation, the force of the restraining means is overcome by frictional engagement between the indexing wheel and the selector wheel thereby causing the latter and the selector knob to rotate with the indexing wheel in said one direction.

3,731,875

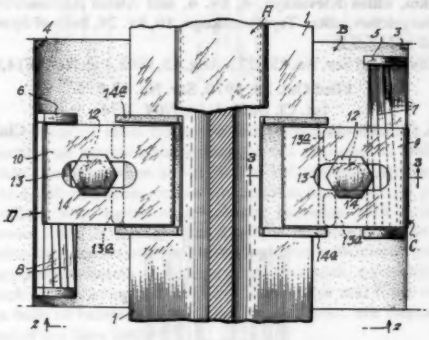
ADJUSTABLE FASTENER ASSEMBLY FOR CONCRETE TIES

Gar Wood N. Burwell, Madison, N.J., assignor to The Rails Company, Maplewood, N.J.

Filed April 28, 1971, Ser. No. 138,115

Int. Cl. E01b *9/66*

U.S. Cl. 238—346 **3 Claims**



A rail fastener comprises a hold-down bolt anchored in a tie and passing through a slot in a clamp plate which abuts the rail base flange and is adjustably associated with a bottom piece slidable longitudinally in an abutment seat in spaced parallel relation to the edge of the rail base flange on the tie, whereby the track gage can be adjusted and at the same time the bolt can be protected against thrusts from lateral movement of the rail; and preferably the clamp plate and bottom piece are formed for wedge-like coaction upon longitudinal movement of the bottom piece in the abutment seat relatively to the clamp plate to produce small movements of the clamp plate toward or away from the rail.

3,731,876

INJECTION SPRAY SYSTEMS

Merle Robert Showalter, 5947 B Western Run Drive, Baltimore, Md.

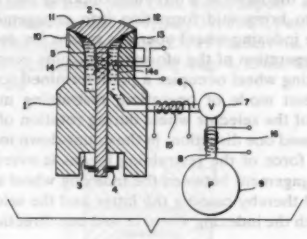
Filed March 19, 1971, Ser. No. 126,179

Int. Cl. B05b *1/24, 17/04*

U.S. Cl. 239—13 **5 Claims**

Injection spray systems and methods are disclosed for spraying heated and pressurized liquid through a nozzle orifice to produce very fine spray droplets. The pressurized liquid is

heated to a temperature above ambient temperature whereby the vapor pressure of the liquid exceeds the pressure outside



of the nozzle orifice so that discharge of the heated and pressurized liquid through the orifice produces very fine droplets.

3,731,877

APPARATUS FOR GENERATING SONIC AND ULTRASONIC VIBRATIONS IN FLUIDS

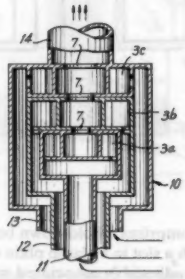
Nikolai Nikolaevich Nekrasov, ulitsa Gargarina, 5-a, kv. 45; Vasily Leonidovich Kazansky, per. Chekhova, 2, kv. 1; Sergei Pavlovich Kirichenko, ulitsa Kutuzova, 22, kv. 52, all of Novokuibyshevsk; Nikolai Nikiforich Tsyganov, pos. Zavodskoi, ulitsa Kievskaya, 4, kv. 4, and Alexei Alexandrovich Sergeichev, ulitsa Tsyolkouskogo, 10, kv. 28, both of Syzran, all of U.S.S.R.

Division of Ser. No. 752,272, Aug. 13, 1968, Pat. No. 3,614,961.

Filed Oct. 23, 1970, Ser. No. 83,678

Int. Cl. B05b *3/14*, *7/04*, *1/34*

U.S. Cl. 239—102 **5 Claims**



An apparatus is provided for producing oscillations in a fluid and the apparatus comprises a plurality of vibration generators arranged in sequence one after the next. Each generator has an annular casing with inlet ports for the introduction of fluid and an outlet port for discharge of fluid. At least two nozzles are mounted in each casing and are constituted by identical spiral shape screens uniformly arranged around the outlet port, adjacent portions of the screens overlapping each other by less than a central angle of 90°. The portions of the screens between the nozzles serve as deflecting blades which define an acute angle with each of the nozzles at the point of intersection of the streams fed from the nozzles. A common housing is provided for the generator casings and the inlet ports are separately fed with fluid, the outlet ports of the individual casings being coaxially arranged to combine the flow from the outlet of the generators in succession and cause the fluid to flow coaxially through the housing to a discharge outlet thereof.

3,731,878

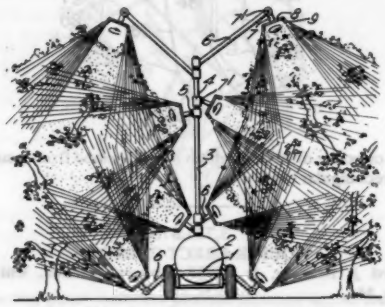
AGRICULTURAL SPRAYER

Jacob Lubetzky, Tel Aviv, and Zeev Svavolski, Ramat Hasharon, both of Israel, assignors to Resses Limited, Tel Aviv, Israel

Filed Oct. 27, 1971, Ser. No. 192,878

Int. Cl. B05b *3/06*

U.S. Cl. 239—166 **8 Claims**



An agricultural sprayer for spraying liquid chemicals, insecticides, and the like, onto trees, shrubs, vines, or fieldcrops, in a continuously turbulent spray so that all the leaves are continuously agitated and therefore are sprayed on all their surfaces. The sprayer apparatus includes a support carrying at least two nozzles which are in communication with a pump supplying a spraying liquid. The support is adapted to rotate about an arm owing to the reaction of the spray and it is angularly adjustable relative to the arm. The arm is angularly adjustable relative to a bar which is adapted to be removably mounted to a pipe or for longitudinal travel between rows of the agricultural crop to be sprayed.

3,731,879

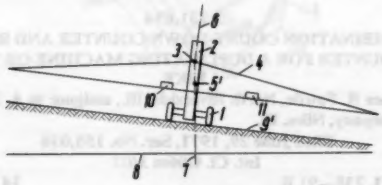
SPRAYING BEAM FOR PEST CONTROL MEANS SUSPENDED FROM A VEHICLE

Hendrik Johannes Hoegen Dijkhof, Doetinchem, Netherlands, assignor to H. J. Hoegen Dijkhof G.m.b.H., Emmerich, Germany

Filed July 7, 1971, Ser. No. 160,440

Int. Cl. B05b *1/20*

U.S. Cl. 239—167 **18 Claims**



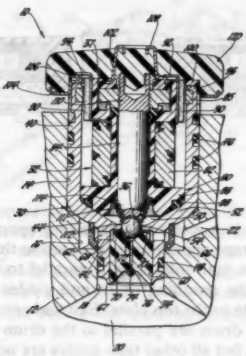
In a spraying beam for pest control means suspended from a vehicle, it is known to mount the spraying beam to the vehicle by a rigid coupling. It is also known to freely suspend the beam from the vehicle to swing about an axis into the horizontal position, relative to the ground surface, so that its centre of gravity always settles vertically below said axis. In the present invention, the beam is suspended from a vehicle to swing about an axis lying in the direction of travel of the vehicle, the beam including a device by which the position of its centre of gravity can be displaced through the suspension axis. The device may comprise one or more trimming weights or an apparatus to displace the geometric suspension axis of the beam. Alternatively, the device may take the form of control signal emitters which act in response to the pivoting angle of one of the signal emitters relative to the spraying beam.

3,731,880

BALL VALVE ELECTROMAGNETIC FUEL INJECTOR

Donald L. Williams, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1971, Ser. No. 187,623
Int. Cl. F16k 31/06
U.S. Cl. 239—585 2 Claims



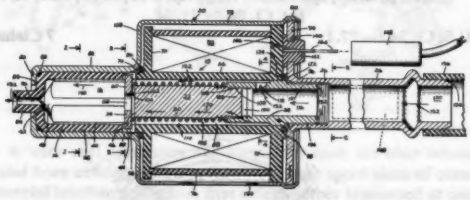
A ball valve electromagnetic fuel injector includes a spring biased low-mass magnetic ball which oscillates with respect to a conical valve seat in the injector case to open and close the fuel supply. A solenoid having a stationary pole piece with a spherical tip recess provides a uniform attractive force in pulling the ball away from the valve seat to the open position in accordance with a fuel metering schedule.

3,731,881

SOLENOID VALVE WITH NOZZLE

Thomas E. Dixon; Robert W. Herr, and Edward D. Sigl, all of Fort Wayne, Ind., assignors to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Feb. 24, 1972, Ser. No. 229,118
Int. Cl. B05b 1/32; F16k 31/02
U.S. Cl. 239—585 17 Claims



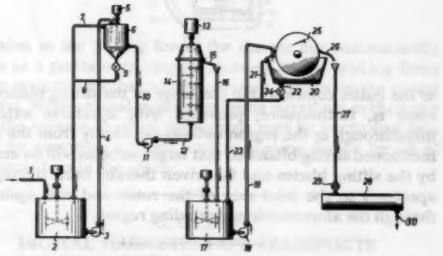
A fuel injection valve having a hollow plastic nozzle with a discharge orifice at its front end, and a plastic bobbin with a hollow barrel and spaced flanges, the nozzle and barrel being in spaced alignment, and a coil surrounding the barrel between the flanges. A valve plunger in the nozzle is movable between closed and opened positions and has a front end which closes the orifice in the closed position, the plunger forming a first fluid passage communicating with the orifice. A magnetic casing surrounds a part of the nozzle and the bobbin and coil, and holds the nozzle and bobbin in assembled relation, the casing having a portion bridging the space between the nozzle and barrel. An armature is attached to the rear end of the plunger and has a portion extending into the space between the nozzle and bobbin and defining a first, fixed airgap with the bridging portion of the casing, the armature also forming a second fluid passage communicating with the first passage. A magnetic core is positioned in the barrel and forms a second airgap with the armature in its closed position, the core, casing and armature forming a magnetic circuit for the coil. The core forms a third fluid passage communicating with the second passage, and a spring normally biases the armature and plunger to the closed position. The core is secured to the casing, and the casing includes an inlet conduit communicating with the third passage.

3,731,882

APPARATUS FOR THE MANUFACTURE OF MOST FINELY PULVERIZED RED PHOSPHORUS

Fritz Muller, Knapsack near Cologne; Karl-Heinz Stendenbach, Bruehl-Pingsdorf; Franz-Josef Dany, Lechenich; Dieter Steidl, Sulzbach/Taunus; Horst Heinrich Weizenkorn, Efferen near Cologne, and Willi Forst, Tiegen, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Division of Ser. No. 860,275, Sept. 23, 1969, Pat. No. 3,628,739. This application Nov. 2, 1971, Ser. No. 194,883
Int. Cl. B02c 15/08
U.S. Cl. 241—46.15 7 Claims



Production of most finely pulverized red phosphorus, by subjecting an aqueous suspension of red phosphorus with a particle size of between about 50 and 100 microns, produced inside a ball mill from yellow phosphorus and water, to pulverization with agitation to obtain particles with a size between 1 and 20 microns, for example 10 microns, prior to filtering the suspension. The red phosphorus is produced using an apparatus wherein preliminary reservoir tank, a preliminary tank and a device provided with an agitator and filled with glass balls of between 1 and 2 mm in diameter, are disposed ahead of the filter tank.

3,731,883

COMMINUTION MILL

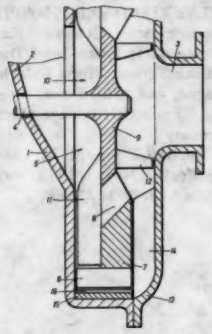
Peter Voelskow, 6550 Bad Kreuznach; Karl Schafer, 6551 Neu-Bamberg uber Bad Kreuznach, in der Lohe 22, both of Germany, and Jacques Pestre, F-81 Labruguiere, Tarn, France, assignors to Inter-Wood-Maschinen GmbH & Co. KG, Bad Kreuznach, Germany

Filed May 12, 1971, Ser. No. 142,670
Claims priority, application Switzerland, May 15, 1970, 7335/70
Int. Cl. B02c 13/13
U.S. Cl. 241—52 6 Claims

The specification discloses a comminution mill, or disintegrator, in which material to be comminuted is introduced into a housing at one side, while the comminuted material is withdrawn from the housing at the other side. Within the housing, a rotor is rotatably mounted and the periphery of the rotor is provided with grinding blades which run inside a grinding ring mounted in the housing and forming therewith a grinding region. On the inlet side of the rotor, the rotor is provided with radially extending vanes which form fan blades and precrushing blades and direct the material entering the inlet toward the aforementioned grinding region and impel it therethrough toward the outlet side of the housing. Inside the housing on the outlet side of the rotor there are arranged

guide vanes which direct the material from the grinding region toward the outlet of the housing.

The rotor is, furthermore, provided with sifting blades extending axially from the rotor on the outlet side thereof in the region of the housing surrounding the aforementioned outlet so that material passing from the aforementioned guide vanes



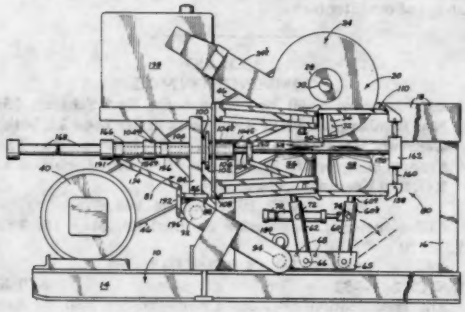
to the outlet comes within the range of the sifting blades. The rotor is, furthermore, provided with apertures extending therethrough in the region radially outwardly from the aforementioned sifting blades so that large particles will be engaged by the sifting blades and be driven thereby back through the apertures to the inlet side of the rotor and will again pass through the aforementioned grinding region.

3,731,884

APPARATUS FOR PREPARING FRAGMENTS FROM TIRE CASINGS

Roy B. Tupper; Myron D. Tupper, both of Sandy, and Norman C. Locati, Lake Oswego, all of Oreg., assignors to Lester M. Thorpe, Portland, Oreg.

Filed Nov. 29, 1971, Ser. No. 202,967
Int. Cl. B26d *1/28*
U.S. Cl. 241—222 **10 Claims**



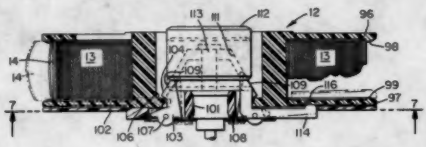
Apparatus for preparing fragments from tire casings and the like. The specific apparatus disclosed means revolvably supporting the tire casing for rotation about its axis. Such supporting means also includes opposed squeeze rollers that bear against opposite sidewalls of the tire casing, thus to flatten the tire casing. Cutting means in the apparatus includes a cutter which moves during operation in successive cutting passes across the periphery of the tire casing adjacent where such is confined by said opposed squeeze rollers.

3,731,885

TAPE REEL AND HUB ASSEMBLY

Raymond C. Siebert, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 24, 1970, Ser. No. 66,497
Int. Cl. B65h *17/02*
U.S. Cl. 242—68.3 **4 Claims**



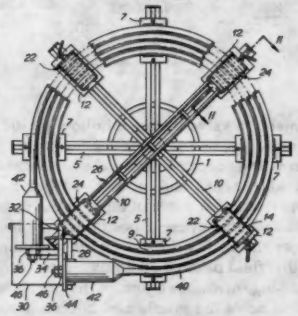
To facilitate automatic self-threading operation, a helical scan magnetic tape apparatus is arranged so that the tape centerline follows a path substantially parallel to the top plate of the machine, the scanning drum and guides therefor being tilted at an angle to the top plate. Exit and entrance guides for the tape at the drum are parallel to the drum axis and therefore also tilted, but all other tape guides are normal to the top plate. The tape is taken off the entrance and exit guides at a predetermined angle that ensures parallelism of the tape centerline to the top plate. A supply reel with the tape and a stiff leader mounted thereon is provided, together with means for driving the leader to the takeup reel, which is provided with means for securing and wrapping the leader and tape. The drum is also arranged for precise change of tilt to facilitate stop and slow motion effects. The tape supply reel is arranged for quick and easy mounting on, and removal from the apparatus. A scanner assembly transformer signal coupling and tachometer is also provided.

3,731,886

APPARATUS FOR SPIRALLY WINDING A SHEATHED CABLE AND DEVICES FOR RETAINING SUCH A CABLE IN A SPIRALLY WOUND CONFIGURATION

Romualdo Macchi, Via S. Paolo 31, Pisa, Italy

Filed April 5, 1971, Ser. No. 130,964
Claims priority, application Italy, April 11, 1970, 9449 A/70
Int. Cl. B65h *75/34*
U.S. Cl. 242—77.1 **7 Claims**



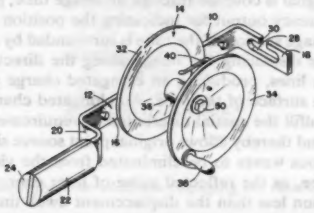
A spirally wound sheathed cable is retained in its spirally wound configuration by means of clamping devices mounted at end portions of a frame extending diametrically across the cable. Further, independent, clamping devices angularly spaced from the frame are supported by the wound cable. The frame is adjustable in length to vary the diametral spacing between the clamping devices carried thereby.

3,731,887

PORTABLE STORAGE REEL FOR LINES

Clayton E. Wheeler, 9125 East Latimer Court, Tulsa, Okla.

Filed March 8, 1971, Ser. No. 121,996
Int. Cl. B65h *75/40*
U.S. Cl. 242—96 4 Claims



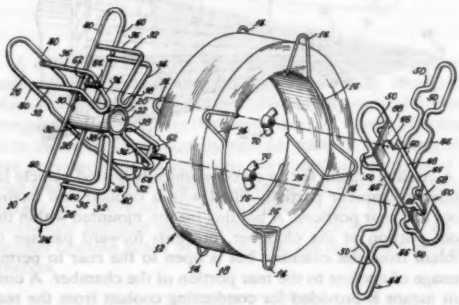
A manually operable portable reel for storing lines, such as water ski tow lines, in a boat when the lines are not in use. A reel is rotatably secured on a support frame or handle unit which may be easily held in one hand while winding or unwinding of the line or cable, and having means for facilitating guiding of the line during the spooling or unspooling operation.

3,731,888

WIRE REEL APPARATUS

Carlis E. Cassel, Niles, and Robert F. Currier, Jackson, both of Mich., assignors to National-Standard Company, Niles, Mich.

Filed June 2, 1972, Ser. No. 258,985
Int. Cl. B65h *75/20*, *49/00*
U.S. Cl. 242—129 3 Claims



A wire reel apparatus has a cylinder core member whose axial bore conforms to standard diameter spool sizes of commercial letoff machines. A first side member is secured at one end of the core member and is formed from a plurality of spaced radial wire frames. A plurality of support members are secured between the other end of the core member and the first side member, and include an axial portion lying in a concentric plane to the axis of the core member to provide a supporting surface for the coils of wire. A detachable second side member is formed of a plurality of spaced radial frame members and is secured in abutting relation with the radial portion of the tie members by means of a pair of clamping devices.

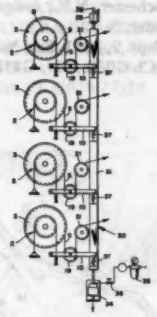
3,731,889

TENSIONING APPARATUS

Alexander V. Alexeff, Cleveland, Ohio, assignor to Alexeff-Snyder Enterprises, Inc., Cleveland, Ohio

Filed Feb. 1, 1971, Ser. No. 111,260
Int. Cl. B65h *59/04*
U.S. Cl. 242—156.2 11 Claims

Tensioning apparatus for maintaining one or more strands under substantially constant tension during pay out includes a let-off stand for each spool of strand material and a pivotally mounted dancer bar having a dancer roll thereon engaging the strand material. A tension load is applied to the dancer bar which controls the amount of braking force applied to each spool. Should the pulling force on the strand material increase, the dancer bar automatically moves to a position causing a reduction in the braking force, whereas should there be a



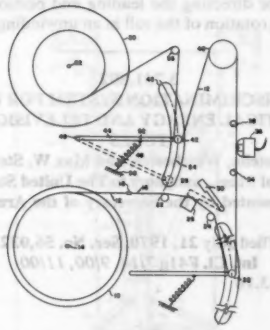
reduction in the pulling force, the dancer bar automatically moves to a position causing an increase in the braking force thus to maintain a substantially constant tension on the strand material. Where plural strands are being payed out at the same time, the tension in all of the strands may be controlled as a group by providing a single load tensioning device for all of the dancer bars in the group.

3,731,890

DIGITAL MAGNETIC TAPE TRANSPORTS

Laurence J. Ruoff, Newport Beach, and Lani W. Brewer, Anaheim, both of Calif., assignors to Data Handling Corporation, Santa Ana, Calif.

Filed Jan. 19, 1972, Ser. No. 218,987
Int. Cl. B65h *59/38*; G03b *1/04*; G11b *1/52*
U.S. Cl. 242—188 12 Claims



This invention relates to a device for sensing tape position on a reel to reel tape handling mechanism. The device is essentially a tape tension arm angular position transducer having two parts, the first part being a photo sensing and emitting mechanism composed of a light emitting diode and two phototransistors arranged on a bias in a sensor assembly beneath the front panel of the tape deck, the second part being a light reflective pattern affixed to and cooperating with the sensor assembly and mounted to the tension arm of the tape handling mechanism. The light reflective pattern consists of two concentric ring segments positioned on a portion of the tension arm, each ring segment having linearly varying light reflectivity to non reflectivity characteristics from end to end in opposite senses. The two photo transistors are each respon-

sive to reflection of light off respective reflective rings and their respective outputs are arranged to produce oppositely biased signals, thereby giving an indication of the arm position. The signals are coupled to the supply or take up reel drive mechanisms to counter balance the tension as desired.

3,731,891

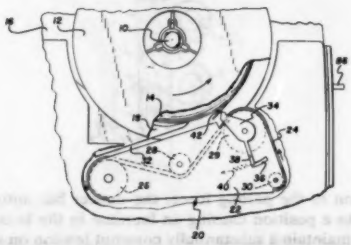
WEB MATERIAL FEEDING APPARATUS

Daniel J. Stark, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,954

Int. Cl. G03b *1/04*; G11b *15/32*

U.S. Cl. 242—195 **9 Claims**



Motion picture projector apparatus includes a spindle for receiving a roll of film or the like and for rotating the roll of film take-up direction through a clutch which is disengaged when the torque between the clutch parts exceeds a predetermined value. A hook-like member is adapted to be moved into close proximity to the rotating roll for engaging the film through an opening in a leading end portion of the film. Engagement of the film by the hook prevents further rotation of the roll in a take-up direction to increase the torque between the clutch parts to a value in excess of the predetermined value. A drive member is engageable with the roll to rotate the roll in an unwinding direction after the clutch has been disengaged. A stripping member is engageable with the roll for separating the leading end portion of the web material from the roll and for directing the leading end portion away from the roll during rotation of the roll in an unwinding direction.

3,731,892

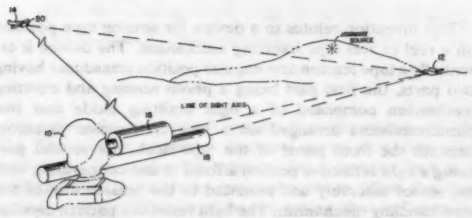
SPATIAL DISCRIMINATION SYSTEM FOR USE WITH PULSED OPTICAL ENERGY AND TELEVISION PICK-UP TUBES

Michael J. Cantella, Winchester, and Max W. Stewich, Chelmsford, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 21, 1970, Ser. No. 56,032

Int. Cl. F41g *7/14, 9/00, 11/00*

U.S. Cl. 244—3.16 **7 Claims**



A spatial discrimination system for use with pulsed optical energy which allows a television viewer or aircraft terminal guidance system to distinguish between steady and pulsed sources of light. Video electronic spatial discrimination takes advantage of the spatial characteristics of a point source to distinguish it from extended spatial objects. Basic spatial discrimination performance is extended to permit rejection of all signals except the desired point source pulse. Laser energy is reflected from a target and detected by the television camera or terminal guidance system in an approaching aircraft. The detected signal is coupled through an image tube, providing a video frequency output for indicating the position of the target. The image section of the tube is surrounded by a modulating coil for displacing the image along the direction of the raster scan lines, producing an elongated charge pattern on the storage surface of the tube. An elongated charge pattern does not fulfill the spatial discriminator requirements for acceptance and thereby allows original point source signals such as continuous waves to be eliminated from the video. For a point source, as the reflected pulse of laser energy having a time duration less than the displacement dwell time on each resolution element, the spatial properties are preserved, thus providing a signal for directing aircraft flight toward the target.

3,731,893

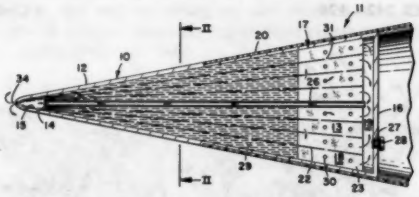
COOLING SYSTEM, EMPLOYING BAFFLING MEANS, FOR AN AERODYNAMICALLY HEATED VEHICLE

Charles J. Stalmach, Jr., Grand Prairie, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.

Filed May 25, 1971, Ser. No. 146,702

Int. Cl. B64g *1/00*; B64c *3/36*

U.S. Cl. 244—1 SS **15 Claims**



A cooling system for an aerodynamically heated vehicle includes a chamber partially filled with a coolant and having front and rear portions. A baffling means, mounted within the front portion of the chamber, prevents forward passage of coolant from the chamber but is open to the rear to permit passage of coolant to the rear portion of the chamber. A conduit means is provided for conducting coolant from the rear portion of the chamber to the external surface of a portion of the outer skin of the vehicle which portion is subject to aerodynamic heating. During high-speed, decelerative, atmospheric flight of the vehicle, e.g., during reentry into the atmosphere of the earth, decelerative forces urge the coolant toward the forward portion of the chamber while aerodynamic heating of the vehicle causes vaporization of the coolant within the chamber. Vaporized coolant flows from the rear portion of the chamber, through the conduit means, to the external surface of the aerodynamically heated outer skin.

3,731,894

SPIRAL BELT JOINT

John D. Curran, Chardon; Zygmunt S. Fredericks, Chesterland, and James D. Marshall, Mentor, all of Ohio, assignors to W. S. Tyler Incorporated, Mentor, Ohio

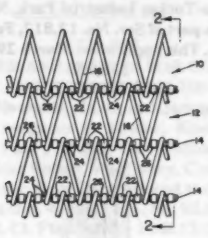
Continuation of Ser. No. 817,962, April 21, 1969, abandoned. This application April 30, 1971, Ser. No. 139,247

Int. Cl. B65g *15/30*

U.S. Cl. 245—6 **15 Claims**

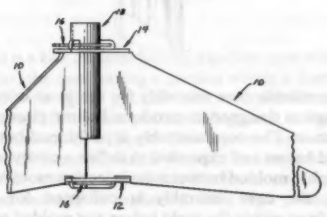
A joint connecting adjacent spirally wound coils of woven wire where two spirally wound wire coils are disposed in substantially parallel position and have intermeshing convolu-

tions. A rod having alternate flat and round sections longitudinally along its length extends through the intermeshing con-



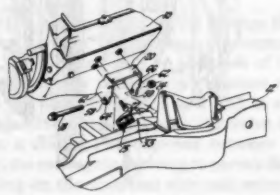
volutions with the convolutions engaging the round sections of the rod.

3,731,895
COLLAPSIBLE TREE STAND
William E. Petrie, 5003 West 159th St., Oak Forest, Ill.
Filed April 14, 1972, Ser. No. 244,108
Int. Cl. A47g *33/12*
U.S. Cl. 248—48 **7 Claims**



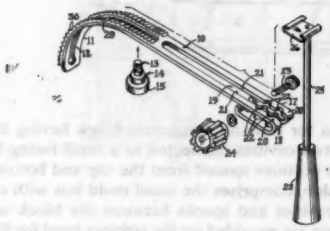
A collapsible stand for supporting a pole or the like vertically off the ground including three, generally triangularly shaped legs each of which has a substantially vertical side with tongues projecting from both ends thereof. A pair of connectors including three equally spaced, radially extending slots are provided, one for receiving the uppermost tongues of the legs and one for the lowermost tongues of the legs. Retaining means are provided for the connectors and the uppermost connector includes an aperture to provide access to an upwardly opening notch in each of the legs for receipt of a pole therein.

3,731,896
ENGINE MOUNT ASSEMBLY
Chester J. Fehlberg, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 7, 1972, Ser. No. 216,203
Int. Cl. F16f *15/00*
U.S. Cl. 248—9 **3 Claims**



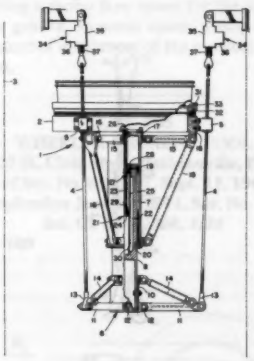
An engine mount assembly for resiliently supporting an engine on a frame of a motor vehicle includes a frame attaching bracket in which is mounted an engine attaching bushing. The bushing and bracket have a plurality of cooperating opposed walls providing separate spaces in which rubber is molded and assembled in compression to provide resilient engine mounting for jounce, for and aft, and roll movement with respect to the frame. The separate spaces provide for the use of different rubbers and different preloads for particular engine-vehicle combinations. In addition, the bushing and bracket cooperate to limit relative movement of the engine with respect to the frame in all directions.

3,731,897
CAMERA BRACKET
Allan S. Price, 1954 N. Fremont Street, Chicago, Ill.
Filed June 30, 1971, Ser. No. 158,215
Int. Cl. G03b *17/56*
U.S. Cl. 248—230 **4 Claims**



A portable support for supporting a camera during use thereof from the shaft of an umbrella, automobile antenna, or the like, wherein means is provided for removably and firmly connecting the camera to the bracket and the bracket to such shaft, the bracket having means for optionally connecting the same to a combination handle and flash unit mount or the like, in lieu of connection to the umbrella shaft or the like.

3,731,898
MISSILE SUSPENSION SYSTEM
Ira D. Smith, Bedford, Ohio, assignor to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed July 27, 1971, Ser. No. 166,461
Int. Cl. F16f *7/00, 9/346*
U.S. Cl. 248—328 **6 Claims**



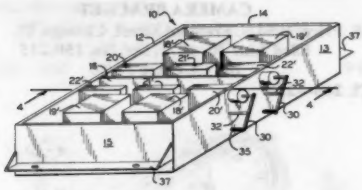
A suspension system for precisely positioning missiles and other structures below ground level comprising a support stand including a pair of telescoping members having a liquid spring therebetween for maintaining the members in resiliently spaced-apart relation. The members are suspended from above by a plurality of cables connected to the lower member, and a support ring for the missile or other structure is carried by the upper member. Angular and vertical adjustment of the suspension system may be achieved after installation by raising or lowering one or more of the suspension cables which adjusts the position of the missile or other structure supported thereby.

3,731,899

APPARATUS FOR PRODUCING CONCRETE BLOCKS WITH UNDERCUT PORTIONS

Gary J. Nuzzo, 100 Roberts Drive, Syracuse, N.Y.

Filed March 1, 1971, Ser. No. 119,739
Int. Cl. B28b 7/20
U.S. Cl. 249—142 1 Claim



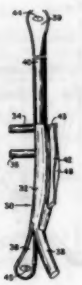
Apparatus for forming a concrete block having the usual block with two cavities connected to a small facing block or slab by web portions spaced from the top and bottom of the block and slab, comprises the usual mold box with cores for the block cavities and spaces between the block and slab. Core portions are provided on the stripper head for filling the spaces between the top of the webs and the top of the block. Core portions are provided for filling the spaces between the bottoms of the webs and the bottom of the block, the core portions being slideable from withdrawn position in cavity core recesses to extended position underlying the web spaces. Motor means are provided on the outer side of the mold box sides for extending and retracting the slideable core portions.

3,731,900

UNITARY CORE FOR MOLDING A NASAL CANNULA

Harold R. Havstad, Lakewood, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed March 22, 1971, Ser. No. 126,452
Int. Cl. B28b 7/28
U.S. Cl. 249—177 8 Claims



A flexible nasal cannula having improved characteristics is produced in a mold cavity incorporating a forming means comprising a transverse core having straight upper portion and a lower portion extending at an angle from the upper portion and a nipple core portion comprising a pair of rod-like extensions located toward the upper end of the upper portion and which extend substantially perpendicular to its axis. In a molding process, the forming means is maintained in spacial relation within a mold cavity, a thermoplastic material is flowed within the cavity around the forming means, cooled sufficiently to set the material and thereafter the cannula is removed from the forming means.

3,731,901

EXPANDABLE CORE ASSEMBLY

Ernest C. Holdredge, Jr., c/o Allastics, Inc., 1275 Enterprise Drive, Norcross-Tucker Industrial Park, Norcross, Ga.

Continuation-in-part of Ser. No. 12,812, Feb. 19, 1970, Pat. No. 3,613,605. This application March 29, 1971, Ser. No. 128,955
Int. Cl. B28b 7/30
U.S. Cl. 249—180 12 Claims

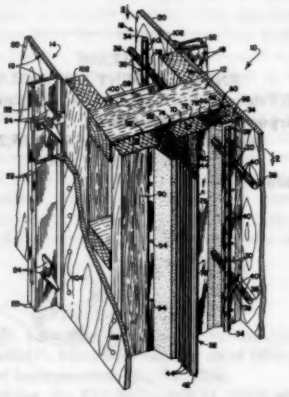
An expandable core assembly for use in an injection molding operation designed to produce hollow plastic articles of manufacture. The core assembly is positioned between injection mold halves and expanded to define a cavity within an article which is molded between the injection mold halves. After molding, the core assembly is collapsed for convenient removal from within the mold halves and molded article.

3,731,902

ADJUSTABLE BULKHEAD FOR A CONCRETE WALL FORM

James C. Shoemaker, Hampshire, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Division of Ser. No. 86,729, Nov. 4, 1970. This application Dec. 16, 1971, Ser. No. 208,855
Int. Cl. E04g 11/00
U.S. Cl. 249—210 5 Claims



An adjustable bulkhead for interim end sealing in a concrete wall or slab form during an interval between concrete pouring operations. A variety of bulkhead components cooperate with one another in sealing relationship to exclude the passage of concrete past any reinforcing rods,

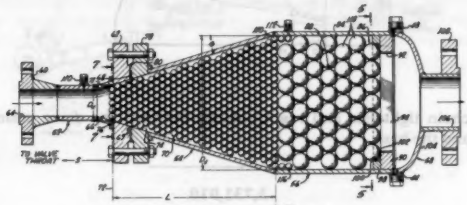
water seals, conduits or other residual concrete-embedded members which traverse or bridge the interfacial surfaces between adjacent concrete pourings.

3,731,903

BALL CANISTER AND SYSTEM FOR CONTROLLING CAVITATION IN LIQUIDS

Albert A. Webb, Riverside, Calif., and James Paul Tullis, Fort Collins, Colo., assignors to Fowler, Knobbe & Martens, Orange, Calif.; Paul J. Tullis, Fort Collins, Colo.; Fred H. Hanson, Riverside; Robert M. Massey, Crestline and Albert A. Webb, Riverside, Calif., part interest to each

Filed Dec. 4, 1970, Ser. No. 95,044
Int. Cl. F16k *47/00*; F16l *55/02*
U.S. Cl. 251—118 **5 Claims**



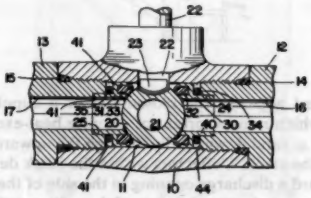
Disclosed is a ball canister having a hollow case with an inlet and an outlet, the case having a portion which is frustoconical and is filled with tightly packed balls, with the diameter and length of the ball filled case portion being sized to significantly repress cavitation in a liquid flow system into which the canister is to be inserted, either alone or in conjunction with a control valve. A sizing method is disclosed and a particular construction example is explained for a high pressure water system.

3,731,904

BALL VALVE

Louis J. Valince, Euclid, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 3, 1972, Ser. No. 223,216
Int. Cl. F16k *5/06*
U.S. Cl. 251—315 **9 Claims**



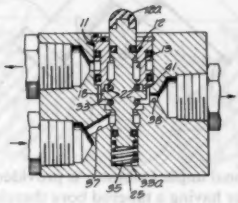
An on-off valve having a body with a passage therethrough, a valve element within the passage to control fluid flow therethrough, a sealing assembly on each side of the valve element and each assembly comprising a retainer ring between the body and the valve element, a seat ring in each retainer ring to seal against leakage between the valve element and retainer rings, a sealing ring disposed between the retainer ring and body, the sealing ring serving to permit fluid bypass of the retainer ring on the upstream side and enter the passage where the valve element is located but to seal and prohibit fluid bypass on the downstream side, the sealing ring on the downstream side engaging parallel faces in the retainer and body to seal against fluid bypass, the sealing ring on the upstream side being expanded in outside diameter by fluid pressure to reduce its cross section to thereby disengage from one of the parallel surfaces and permit fluid bypass, and the sealing assemblies being identical whereby either side of the flow passage may be the inlet or outlet.

3,731,905

POPPET VALVE STRUCTURE HAVING O-RING SEAT SEAL

Meyer Piet, Arcadia, Calif., assignor to Futurecraft Corporation, Industry, Calif.

Filed Nov. 3, 1971, Ser. No. 195,247
Int. Cl. F16k *43/00*
U.S. Cl. 251—333 **6 Claims**



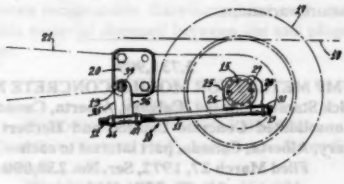
A poppet valve structure preferably for controlling flow of low pressure fluids, which is adapted for use in a multiplicity of valve arrangements, and embodies valve seat and valve members concentrically associated and alternately axially movable to valve closed and valve opened positions, one of the members having a circumferential groove of substantially semicircular cross-section for receiving a circumferential peripheral portion of an O-ring of circular cross-section without distortion, and so that substantially half the cross-sectional area circumferentially projects, the other member having a circular seating surface engageable and disengageable with respect to the projecting portion of the ring adjacent one wall of the groove, the other wall of the groove being extended to provide a back-up surface on the opposite side of the ring from the seating surface, and the seating surface and back-up surface providing a radial flow space for the ring material exteriorly of the groove. In some cases, a stop is provided for limiting the extent of movement of the members towards valve closed position.

3,731,906

WHEEL ALIGNMENT TOOL

Bill Beach, 1629 St. Clair Street, Jacksonville, Fla.

Continuation of Ser. No. 856,991, Sept. 11, 1969, abandoned. This application June 14, 1971, Ser. No. 153,046
Int. Cl. B66f *3/08*, *3/36*
U.S. Cl. 254—100 **16 Claims**



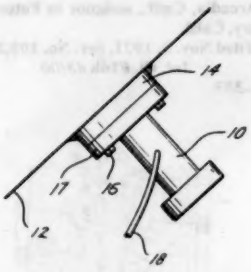
The tool includes an elongated rod with an adjustable clamping device on one rod end portion and another clamping device on the other rod end portion.

3,731,907

VIBRATOR SYSTEM

Don B. Lash, Houston, Tex., assignor to National Air Vibrator Company, Houston, Tex.

Filed July 8, 1971, Ser. No. 160,878
Int. Cl. B01f 11/00
U.S. Cl. 259—1 R 14 Claims



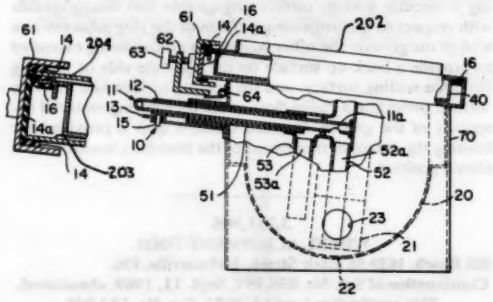
A unidirectional impact vibrator is provided which includes a sleeve member having a tapered bore therein for positioning upon a correspondingly tapered pin member. An adaptor unit is provided which may be affixed to a surface to be vibrated, and which includes a pin member having a taper corresponding to the taper of the bore in the sleeve of the vibrator provided.

3,731,908

APPARATUS FOR CLEANSING SOFT OR HARD GOODS

Eli Raitport, 1807 Mower St., Philadelphia, Pa.

Filed Oct. 29, 1969, Ser. No. 873,775
Int. Cl. D06f 1/08, 1/10
U.S. Cl. 259—4 13 Claims



A container for cleaning and polishing, having a hermetically sealed loading opening and telescopically arranged fluid inlets. Fluid motion is created in the container by a pump and temperature variations.

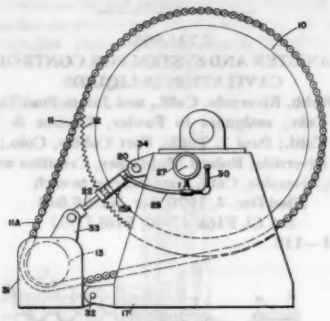
3,731,909

SLUMP METERS FOR MOBILE CONCRETE MIXERS

Frederick Stanley Johnson, Calgary, Alberta, Canada, assignor to Consolidated Concrete Limited and Herbert T. Welch, Calgary, Alberta, Canada, part interest to each

Filed March 27, 1972, Ser. No. 238,090
Int. Cl. B28c 5/18
U.S. Cl. 259—177 8 Claims

A closed hydraulic piston and cylinder assembly is connected to a pressure gauge and is acted upon by the drive chain so that a variation of the load in the drum, which is a function of the slump condition of the concrete, is read out directly on a pressure gauge which may be calibrated directly in inches of slump. The device may either have a sprocket engaging the drive chain or may substitute for the conventional



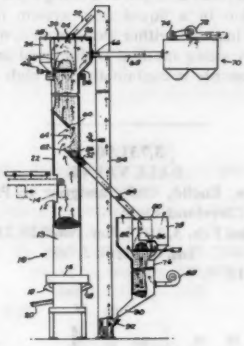
chain tightener and react directly between the drive casing and the base.

3,731,910

CUPOLA STRUCTURE

Thomas J. Butler, 7625 E. Morrow Circle, Dearborn, Mich.

Filed May 17, 1971, Ser. No. 144,024
Int. Cl. F27b 1/18
U.S. Cl. 263—29 17 Claims



Mounted adjacent the closed top of a cupola stack is a hopper which rains a torrent of discrete heat-exchange particles such as sand downwardly through the upward flowing hot gases in the stack. Deflectors within the stack deflect the torrent toward a discharge opening in the side of the stack above the melt zone. Accumulated particles adjacent the discharge opening seal the gases against escape therethrough. An outlet from an expansion chamber adjacent the top of the stack passes the cooled gases to a conventional filter which removes the smoke burden from the gases.

3,731,911

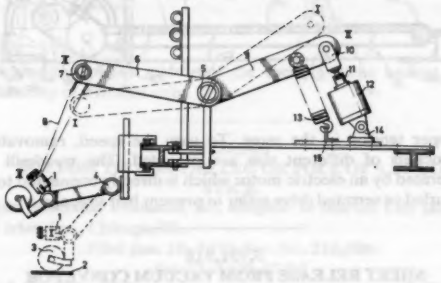
DEVICE FOR RAISING AND LOWERING THE TORCHES OF A FLAME CUTTING MACHINE

Georg Roder, Frankfurt/Main, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Nov. 2, 1970, Ser. No. 86,073
Int. Cl. B23k 7/02, 7/10
U.S. Cl. 266—23 M 10 Claims

A device for raising and lowering torches of flame cutting machines includes parallel swivel levers mounted about a common horizontal axis with a rod extending between the free

ends of the levers and the torches mounted to the rod. A resilient restoring force is utilized to hold the torches in the



driving position, while an activation arrangement is utilized for overcoming the restoring force.

3,731,912

CONTAINERS WITH SLIDING VALVE FOR LIQUID SMELT

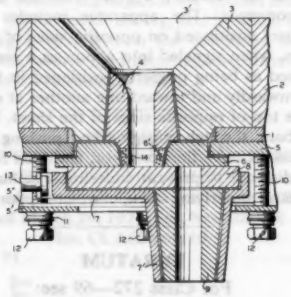
Hans-Joachim Kutzer, Wiesbaden-Rambach, Germany, assignor to Didier-Werke A.G., Wiesbaden, Germany

Filed July 24, 1970, Ser. No. 57,979

Claims priority, application Germany, July 26, 1969, P 19 38 117.0

Int. Cl. C21b 7/14

U.S. Cl. 266—38 **6 Claims**



A container has a sliding valve for a liquid smelt. A refractory block with an insert is set in the bottom of the container. An orifice plate of refractory material is connected to the block and has a flow-passage, and a valve plate having a flow passage for the smelt is located therebelow. A support on the bottom of the cohtainer on which the valve plate slides provides a sealing action upon being linearly and rotatively displaceable in relation to the orifice plate. An outflow and a driving device is combined with the valve plate. A refractory body is set in a bore in the orifice plate and has means to feed an inert gas into the smelt.

3,731,913

SPRINGS

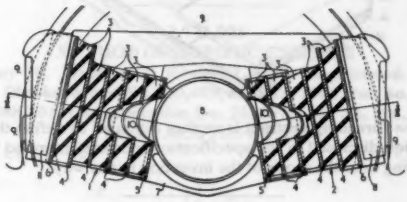
Archie J. Hirst, deceased, late of Leicester, England (by Renate Hirst, Legatee), assignor to Dunlop Holdings Limited, London, England

Filed April 5, 1971, Ser. No. 131,148

Claims priority, application Great Britain, April 7, 1970, 16,284/70

Int. Cl. F16f 1/36

U.S. Cl. 267—63 R **11 Claims**



A spring and a suspension system primarily for railway vehicles, comprising a chevron-type rubber sandwich spring in which the spring width increases towards the apex end of the spring wherein the central region of the apex-end of the spring is cored-out to provide a cavity extending into the spring. Of which the following is a specification.

3,731,914

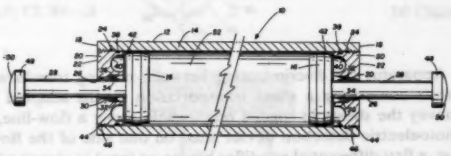
DOUBLE ENDED SPRING SHOCK ABSORBER

Geoffrey Wilton Cope, Williamsville, and Loren William Smith, Eggertsville, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed March 18, 1971, Ser. No. 125,669

Int. Cl. F16f 5/00

U.S. Cl. 267—65 R **9 Claims**



Double ended spring shock absorber consisting of a cylinder having pistons reciprocable therethrough at each end and a compressible material disposed between the end plugs within the cylinder.

3,731,915

FEED ROLL ABRASION ROLLER

Joachim Guenther, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

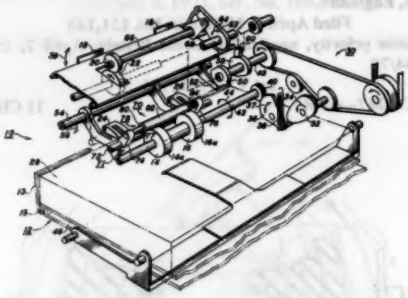
Filed Nov. 8, 1971, Ser. No. 196,691

Int. Cl. B65h 3/06

U.S. Cl. 271—36 **9 Claims**

An apparatus in which an abrasive member is positioned in rubbing engagement with a moving separating and advancing means of a sheet forwarding mechanism to retain a preselected frictional force between the separating and ad-

vancing means and successive single sheets for permitting the efficient separation and advancement thereof.



The foregoing abstract is neither intended to define the invention disclosed in the specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,731,916

DISCRIMINATING APPARATUS FOR MOVING TRANSLUCENT SHEETS

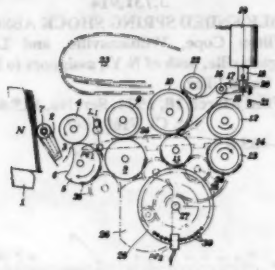
Ronald Sidney Pettet, Horndean, England, assignor to De La Rue Instruments Limited, London, England

Filed June 1, 1971, Ser. No. 148,744

Claims priority, application Great Britain, June 1, 1971, 26,940/70

Int. Cl. B65h 7/00

U.S. Cl. 271—57 **17 Claims**



Apparatus for discriminating between moving translucent sheets comprising a sheet transportation means adapted to convey the sheets in spaced relationship along a flow-line, a photoelectric detection device sited on one side of the flow-line, a first differential amplifier having an input in circuit with the said detection device and adapted to produce a first output signal every time the photoelectric device detects attenuation of the light source in excess of a first predetermined value, and a second differential amplifier having an input also in circuit with the said detection device and adapted to produce a second output signal every time the photoelectric device detects attenuation of the light source in excess of a second different predetermined value.

3,731,917

TREADMILL EXERCISING DEVICE

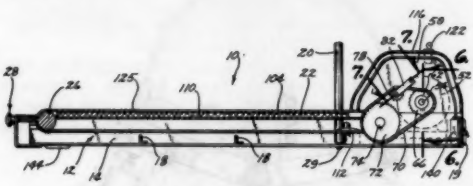
Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Feb. 25, 1971, Ser. No. 118,861

Int. Cl. A63b 23/06

U.S. Cl. 272—69 **4 Claims**

A treadmill exercising device comprising first and second spaced apart rollers mounted on a frame so that they are each rotatable with respect to a horizontal axis. An endless belt extends around and between the rollers and includes an upper walking belt portion which slides upon a smooth, highly polished, heat resistance support surface as a person walks on the upper walking belt portion. Additional features are provided for varying the speed of the belt and for maintaining the



proper tension in the same. To vary the speed, removable sprockets of different size are provided. The treadmill is operated by an electric motor which is directly connected to a knurled or serrated drive roller to prevent belt slippage.

3,731,918

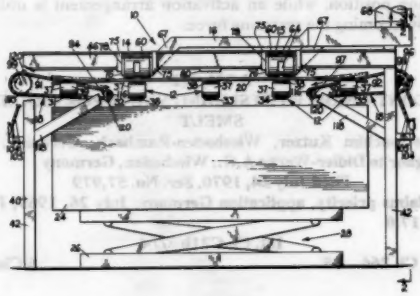
SHEET RELEASE FROM VACUUM CONVEYOR

Charles L. Larson, Crants Pass, Oreg., assignor to Jeddeloh Bros. Sweed Mills, Inc., Gold Hill, Oreg.

Filed May 20, 1971, Ser. No. 145,170

Int. Cl. B65h 29/68, 29/24

U.S. Cl. 271—74 **7 Claims**



Apparatus for releasing a sheet from the underside of a vacuum conveyor. The apparatus includes spaced-apart movable bars positioned on opposite sides of the conveyor, which bars, when signaled into action as a result of a sheet being sensed as being properly positioned in the apparatus, move downwardly and toward one another at oblique angles against the top of opposite sides of the sheet. With such action, the bars, through engaging and pushing down on the sheet, release it from the conveyor, and then follow its fall a sufficient distance to prevent undesirable sailing as the sheet approaches an underlying stack, or other support.

ERRATUM

For Class 272—69 see:
Patent No. 3,731,917

3,731,919

TRAINING APPARATUS FOR SKIERS

Ernst Schurch, Obergrundstr. 3, Lucerne, Switzerland

Continuation-in-part of Ser. No. 827,665, May 26, 1969, abandoned. This application July 1, 1971, Ser. No. 158,865

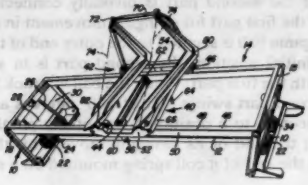
Claims priority, application Switzerland, May 30, 1968, 8195/68

Int. Cl. A63b 69/18

U.S. Cl. 272—57 B **7 Claims**

A sliding carriage equipped with separate removable pedals disposed on a rocking-frame engaged against the force of a

spring slanting toward its smaller ends while the carriage is



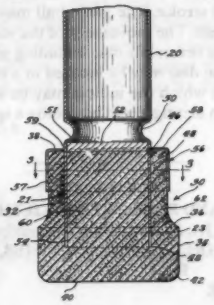
moving out of the middle of the rocking-frame against the elasticity of a rubber strip.

3,731,920

BOTTOM TIP FOR THE LEG OR POLE OF A POGO STICK

Hari Matsuda, Evanston, Ill., assignor to Martin Yale Industries, Inc., Chicago, Ill.

Filed Jan. 10, 1972, Ser. No. 216,606
Int. Cl. A63b *25/08*
U.S. Cl. 272—57 E **7 Claims**



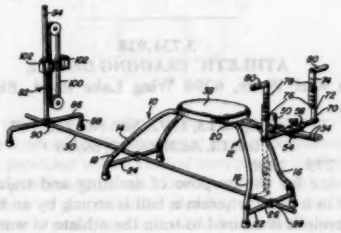
A bottom tip for the leg or pole of a Pogo stick, which tip comprises a member formed of a resilient material, such as rubber or the like, provided with an intermediate annular groove or recess in which the lower end of the tubular leg or pole is received so that a portion of the resilient material of the tip is within the tubular leg adjacent the bottom thereof and a portion of the tip surrounds the leg, and in which the bottom edge of the leg is spaced from the bottom of the annular groove or recess, with a rigid retaining ring surrounding the outer portion of the resilient member.

3,731,921

BENCH FOR SIMULATING AND DEVELOPING SWIMMING MOVEMENTS

Clarence W. Andrews, Jr., P. O. Box 409, Russellville, Ky.

Filed March 29, 1971, Ser. No. 128,736
Int. Cl. A63b *69/10*
U.S. Cl. 272—71 **6 Claims**



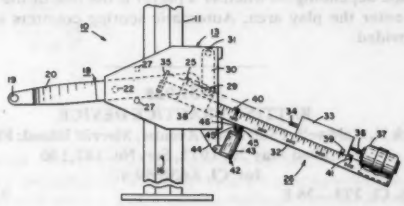
A horizontally disposed elongated but short bench including an extension support projecting outwardly from a first forward end thereof and having a pair of opposite side crank arms supported therefrom for swinging about a horizontal transverse axis. The bench is to be laid upon by a person in horizontal chest downward position with the chest resting upon the bench and the crank arms engaged by the hands. A rearwardly displaced portion of the bench includes opposite side vertically reciprocal foot receiving portions and the person laying upon the bench may exercise in a manner simulating various swimming strokes, the crank arms being adjustable in effective length and adjustable angularly relative to each other about their axis of rotation. Further, the foot-receiving portions may be supported either for equal inverse reciprocation or simultaneous reciprocation.

3,731,922

METHOD OF ISOTONIC EXERCISE

Sidney W. Jungreis, 21 Roosevelt Road, Mapplewood, N.J.

Division of Ser. No. 760,409, Sept. 18, 1968, Pat. No. 3,588,101. This application Jan. 21, 1971, Ser. No. 108,314
Int. Cl. A63b *21/24, 21/00*
U.S. Cl. 272—81 **6 Claims**



Method of isotonic exercise involving the lifting of a load responsive arm to approximately the waist position and holding it there while varying loads are applied to the load responsive arm.

3,731,923

ARTIFICIAL SKI SLOPE

Woodrow P. Greene, Atlanta, Ga., assignor to Snow Products, Inc., Atlantic, Ga.

Filed April 26, 1971, Ser. No. 137,321
Int. Cl. E01c *13/00*
U.S. Cl. 94—3 **10 Claims**

An artificial ski slope made of plastic artificial grass in which is retained granular plastic material.

3,731,924

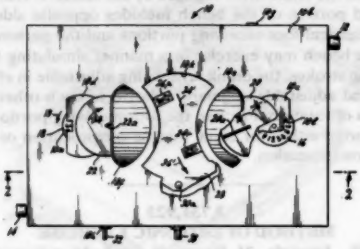
ACTION GAME

Michael I. Rackman, 1710 Glenwood Road, Brooklyn, N.Y., and Morton P. Matthew, RFD 2, Kreiner Lane, Norwalk, Conn.

Filed March 15, 1971, Ser. No. 124,060
Int. Cl. A63f *9/00*
U.S. Cl. 273—1 E **7 Claims**

An action game where each of two players controls movement of a respective piece along one of two predetermined paths which are adjacent to each other in a "play area." Each player can see the other player's piece only when it is in the play area; he is given an indication of the position of his own

piece at all times. A player scores a point if his piece catches the other player's piece in the play area. By skillful control of the speed of his piece while correctly estimating the position of the other player's piece when it is not is the play area and



therefore not visible to him, a player can score the number of points necessary for a win. The pieces automatically change shape depending on whether a player is the first or the second to enter the play area. Automatic scoring counters are also provided.

3,731,925

BATTING PRACTICE DEVICE

Jack N. Caldwell, 1500 Holly Avenue, Merritt Island, Fla.

Filed May 26, 1971, Ser. No. 147,130

Int. Cl. A63b *69/40*

U.S. Cl. 273—26 E **7 Claims**

A batting practice device for use by a person skilled in the art of coaching and training a youngster how to stand at home plate, how to keep his eyes on a real baseball which is caused to sweep in varying paths (high, low, and otherwise) across the plate, how to time his batting swing and, also how to acquire the feel of batting the ball. It comprises a suitably elongated hollow barrel through which a flexible nylon or similar tethering line is slidingly threaded. This barrel provides a line stabilizing and whirling holder designated as a control stick. A regular baseball is captively mounted on the outward end of the line. A first handgrip is provided on the inward end. A second spring biased handgrip is slidingly mounted on the flanged inner end of the barrel. These handgrips, when properly grasped and used, will enable the user to swing the tethered ball in a circular path and to deliver the ball to the wary but eager batter.

3,731,926

TRAINING DEVICE INCLUDING CAPTIVE BALL TO BE STRUCK BY GAME CLUB

Douglas Lincolne Vincent, 26 Chelsea Avenue, Broadbeach, Queensland, Australia

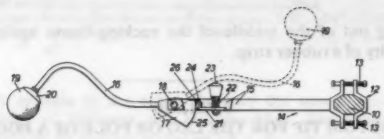
Filed Oct. 28, 1970, Ser. No. 84,859

Claims priority, application Australia, Oct. 31, 1969, 63183/69

Int. Cl. A63b *69/40, 61/00, 67/02*

U.S. Cl. 273—26 E **3 Claims**

A game ball is tethered to a vertical support. The tethering structure includes first and second horizontally extending parts. The inner end of the first part is clamped to the vertical support and capable of being vertically adjusted thereon. The inner end of the second part is pivotally connected to the outer end of the first part for swinging movement in a horizontal plane. A game ball is secured to the outer end of the second part. In its initial position, the second part is in substantial alignment with the first part. When the ball is struck by a game club, the second part swings almost 180° degrees around the pivotal connection to a position substantially parallel to the first part. At the end of its swinging movement, the second arm engages the end of a coil spring mounted on a side of the



first part, which causes the second part to rebound to its initial position. As the second part approaches its initial position, a complementary cam and nylon button on the second and first parts, respectively, coact to brake the second part to a halt ready for the next stroke. The game ball may be a tennis ball, baseball, or golf ball. The movement of the second part can be employed to spin a reversible disc including gone indicia on its opposite sides. The disc may be located in a housing including a window through which the indicia may be seen and the disc may be spun by an arrangement including a spindle, gear, rod, spring and pawl.

3,731,927

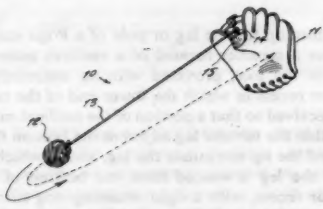
GLOVE AND BALL TETHERED THERETO

Thomas J. Rocco, Jr., 26 Aster Court, Brooklyn, N.Y.

Filed Oct. 13, 1971, Ser. No. 188,727

Int. Cl. A63b *69/40*

U.S. Cl. 273—26 E **6 Claims**



A novelty sports toy for diversion and enjoyment to youngsters and others, the device consisting of a base ball glove to which there is tethered one end of a stretchable elastic rubber, the opposite end of the rubber being attached to a knotted ball of rubber bands, the ball accordingly being adaptable to the thrown a short distance during which the rubber becomes gradually more taut so that it finally pulls the ball back toward the glove where the player tries to catch it in the glove.

3,731,928

ATHLETIC TRAINING DEVICE

Warren Earl Wolfe, 6290 Wing Lake Road, Birmingham, Mich.

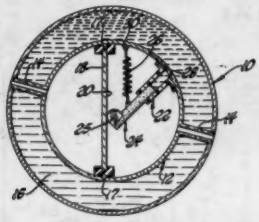
Filed April 13, 1972, Ser. No. 243,767

Int. Cl. A63b *69/40, 69/36*

U.S. Cl. 273—26 R **13 Claims**

A device for the purpose of assisting and training an individual in a sport wherein a ball is struck by an instrument, and wherein it is desired to train the athlete to watch the ball at the instant of impact of the implement therewith. The device includes an outer spherical member having a translucent portion, and disposed within the outer sphere is an abrasive surface adapted to be engaged by a spark producing

device at the instant of impact. The abrasive surface may be located either on a wall located inside the outer spherical member, on the outer surface of a second spherical member located centrally of the outer spherical member or on a wall

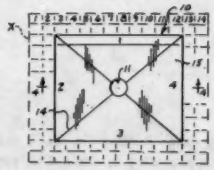


extending across the second spherical member. In the latter instance,the space between the two spherical members may be filled with a fluid which drives the spark producing device, e.g., a flint, across the abrasive surface.

3,731,929
OSCILLATORY RESILIENT BODY AND TETHER
Raoul R. Landry, Montreal, Quebec, Canada, assignor to Des-Land Products Reg'd, Longueil, Quebec, Canada
Filed April 19, 1971, Ser. No. 96,641
Int. Cl. A63f 7/02
U.S. Cl. 273—95 A **6 Claims**

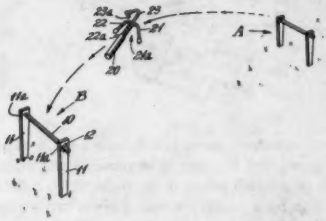
A toy having a body resilient material and a substantially inextensible extending through the body and adapted to attach an elastic cord at opposed ends of the body to permit said body to be oscillated between two players.

3,731,930
PROJECTILE AND TARGET HAVING A RESILIENT FRICTIONAL RESISTANT SURFACE CAUSING AN IMPINGING PROJECTILE TO BOUNCE BACK TOWARD THE PROJECTOR
Howard T. Jeandron, 42 First St., Keyport, N.J.
Filed Jan. 26, 1971, Ser. No. 109,762
Int. Cl. A63b 7/02
U.S. Cl. 273—95 R **7 Claims**



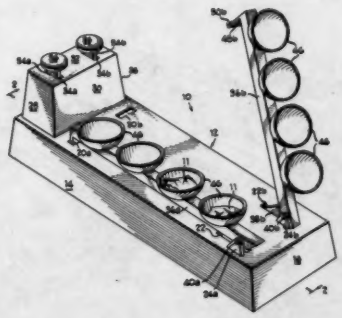
A game pad and a plurality of discs in which the pad is comprised of a sheet of resilient material such as polyurethane and the pad is provided with a central aperture or pocket. In use the pad is positioned in a horizontal solidly backed position upon the floor or ground and a plurality of discs similar in size and weight to a penny are utilized to be tossed from a distant point into the pocket on the pad. Because the pad is formed of a resilient polyurethane material having the property of instant recoil, a surface friction to resist slippage of the projectile upon the pad is inherently developed and the resultant compressive force caused by the force of the impinging projectile is great enough to bounce the projectile forwardly in its original line of trajectory and away from the surface of the pad.

3,731,931
HORIZONTAL TARGET BAR AND HOOKED PROJECTILE
Frank P. Monaco, 19 Longmeadow Road, Shelton, Conn.
Filed Sept. 21, 1971, Ser. No. 182,375
Int. Cl. A63b 71/04
U.S. Cl. 273—95 R **9 Claims**



A game of skill generally similar to quoits or horseshoes having a projectile to be tossed toward a scoring stake having a horizontal section, said projectile having a handle provided with hooks projecting longitudinally from one end and which are capable of interlocking with said scoring stake. If desired the hooks on the projectile may be distinctively marked with scoring indicia.

3,731,932
TARGET RECEPTACLES HAVING MECHANISM TO DISLODGE PROJECTILES TOSSED THEREIN
Jeffrey D. Breslow, Chicago, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicgo, Ill.
Filed Jan. 14, 1972, Ser. No. 217,861
Int. Cl. A63b 71/02
U.S. Cl. 273—102.1 C **5 Claims**

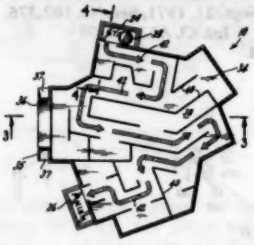


A target game of the type wherein throwable missiles are aimed at competitive receiving stations with each receiving station mounted on a support for movement between a retracted position and an extended position and characterized by the provision of a latch means for normally holding each receiving station in a retracted position with the latch means being releasable responsive to reception of a playing piece thereon to permit movement of the receiving station to an extended position which dislodges the playing pieces therefrom.

3,731,933
GAME BOX HAVING A MAZE

Perry J. Grant, Pacific Palisades, Calif., assignor to Reuben B. Klamer D/B/A Reugen Klamer & Associates, Beverly Hills, Calif.

Filed May 20, 1971, Ser. No. 145,123
Int. Cl. A63f 7/04
U.S. Cl. 273—113 7 Claims

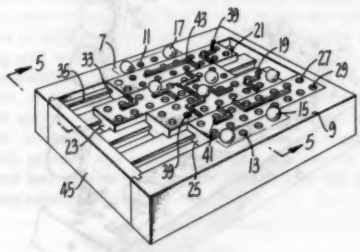


A game box includes a game box having a maze as part of its structure. A game ball is adapted to traverse the maze from a start position to a finish position in response to manipulation of the game box by a player. A transparent top wall encloses the game ball within the game box and enables the maze and game ball to be viewed by the player. An opaque cover is selectively movable from a first position, wherein the maze and game ball may be viewed by the player, to a second position wherein the maze and game ball are hidden from the view of the player. A schematic representation of the maze is inscribed on the opaque cover and may be viewed by the player when the cover is in the second position to aid the player in manipulating the game ball from the start position to the finish position when the maze and game ball are hidden from view.

3,731,934
BOARD GAME APPARATUS

Philip L. Shoptaugh, 5860 Buena Vista Avenue, Oakland, Calif.

Filed Aug. 5, 1971, Ser. No. 169,363
Int. Cl. A63f 3/00
U.S. Cl. 273—131 AB 6 Claims

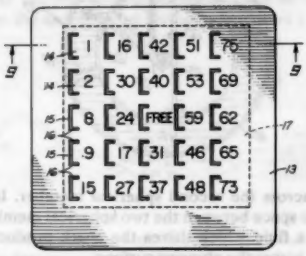


A game board having a series of sliders with spaces thereon for the playing pieces and also containing barrier elements. The sliders are mounted for lateral movement between home positions disposed at opposite sides of the board. Each slider has two rows of spaces and the barrier elements are arranged to separate adjacent spaces in one row and to separate a space in one row from the aligned space in the other row. The object of the game is for one player to move his playing pieces from one side of the board to the other before his opponent.

3,731,935
GAME BOARDS

James F. Moore, Jr., 1515 W. Thomas Avenue, Englewood Colo.

Filed Nov. 17, 1971, Ser. No. 199,532
Int. Cl. A63f 3/06
U.S. Cl. 273—136 F 7 Claims

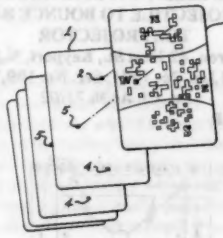


A laminated bingo board consisting of the following superimposed laminations: a back board; a first spacing board; a game number board; a transparent plastic slide guide sheet; a second spacing board; a window board; and a plurality of substantially flat and flexible number-covering slides. The number board has a vertical knife cut positioned at the side of each number thereon and short horizontal cuts communicating with the ends of the vertical cut, so that the slide of that number may be moved through a space provided by deflecting a portion of the number board adjacent said cuts to a concealed position directly beneath an adjacent number. If the slide of a "called" number is withdrawn from its concealed position below the adjacent number it will slide over and cover the "called" number.

3,731,936
COMPETITION BRIDGE CARDS

Ben H. Copeland, 2066 East Balboa, Tempe, Ariz.

Filed Oct. 12, 1971, Ser. No. 188,191
Int. Cl. A63f 1/14
U.S. Cl. 273—149 P 10 Claims



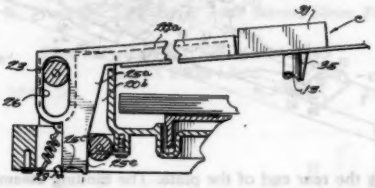
A deck of playing cards having the back side of each card coded by means of a plurality of dots. The pattern of dots is identical on each card but is longitudinally and/or laterally displaced by a different amount on each card. An overlay card is divided into distinct areas with a selected positioning of a plurality of apertures, or transparent portions, in each area. On registration of the overlay card with each playing card, one of the dots in the card will be visible through one of the apertures in the overlay card. The area within which that dot appears directs the dealer as to which of the players is to receive that card. This process continues until all cards in the playing deck have been dealt. In this manner, the players will receive a predetermined arrangement of cards.

3,731,937

PHONOGRAPH RECORD PLAYING APPARATUS

Robert L. Van Antwerp, St. Joseph, and Larry M. Hughes, Coloma, both of Mich., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed July 13, 1970, Ser. No. 54,337
Int. Cl. G11b 17/04
U.S. Cl. 274—10 R 23 Claims



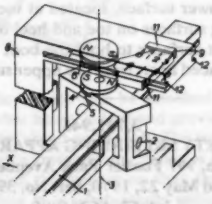
The disclosure relates to phonograph record playing apparatus, supporting and positioning records in a manner which provides an unusually low profile for the equipment. The disclosure emphasizes the relationship between a shaped spindle and a record stabilizing assembly. The assembly includes a support disposed outwardly of the periphery of a turntable and an elongate record engaging member having an outer end mounted for linear and pivotal movement with respect to the support. The elongate member is disposed radially of a spindle for the turntable and is both pivotally movable and slideable in a vertical plane between a loading position, a plurality of operating positions and a rest position. When the elongate member is in the raised loading position, one or more records may be loaded on or removed from the spindle. When in the rest position, the elongate member deactivates the equipment.

3,731,938

RECORD PLAYERS

John Pelham Wren, Chiseldon, England, assignor to Plessey Handel Und Investments A. G., Zug, Switzerland

Filed May 26, 1971, Ser. No. 147,006
Claims priority, application Great Britain, June 2, 1970, 26,590/70
Int. Cl. G11b 3/10
U.S. Cl. 274—23 R 3 Claims



A pick-up arm arrangement in which for the reduction of side thrust due to "tracking error" a disc magnet (ferrite) is mounted on the pick-up arm with the axis of the magnet lying along the vertical pivotal axis of the arm while another disc magnet is mounted on a fixed part of the pick-up mounting arrangement and spaced from the magnet along the axis so that in response to pivotal movement of the pick-up about its vertical pivot during the playing of a record the magnetic interaction between the poles of the magnets produced a magnetic force on the arm which opposes the side thrust on the arm. A magnetic shield may be interposed between the magnets in order to afford control of the magnetic force acting on the arm.

ERRATUM

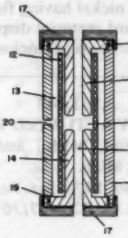
For Class 277—15 see:
Patent No. 3,731,865

3,731,939

WELLBORE INSTRUMENT SEALING APPARATUS

Leslie J. Wright, Collinsville, and Reginald G. Ford, Tulsa, both of Okla., assignors to Cities Service Oil Company, Tulsa, Okla.

Filed May 28, 1971, Ser. No. 148,064
Int. Cl. F16j 15/10
U.S. Cl. 277—34 3 Claims



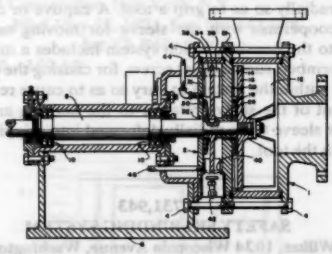
Disclosed herein is apparatus to be utilized in conjunction with a wellhead assembly consisting of a steel body accomodating a Hassler type sealing sleeve. The apparatus is utilized for sealing wellbore test instruments which are extended within a wellbore containing fluids under low pressures and is particularly applicable to the sealing of thermocouple lines which conventionally are most difficult to adequately seal, generally requiring large apparatus to form the seal.

3,731,940

ELASTOMER SEAL WITH A PLURALITY OF ANNULAR RIBS FOR A ROTATING SHAFT OF A CENTRIFUGAL PUMP OR THE LIKE

Walter L. Spruiell, 210 W. Texas, Iowa Park, Tex.

Filed Aug. 6, 1971, Ser. No. 169,616
Int. Cl. F04d 29/08, 29/22
U.S. Cl. 277—12 2 Claims



An elastomer seal for a rotating shaft of a centrifugal pump which has annular ribs and is so cupped as to form a seal when the centrifugal pump is in static condition, which also seals at various slow speeds until the pump attains sufficient centrifugal pumping speed to divert the fluid being pumped away from the shaft, and with the annular ribs forming seals with the wall of the pump housing in sequential relation as the speed of rotation of the shaft decreases and becomes static.

3,731,941

FACING MATERIALS FOR AN INTERNAL COMBUSTION ENGINE CYLINDER AND A COOPERATING PISTON RING

Yoshio Mori, Tokyo; Yoshihito Sato, Kawaguchi, and Kentaro Takahashi, Omiya, all of Japan, assignors to Nippon Piston Ring Kabushika Kaisha, Tokyo, Japan

Filed Dec. 1, 1971, Ser. No. 203,877

Claims priority, application Japan, Dec. 12, 1970, 45/110109

Int. Cl. F16J 9/12, 15/08

U.S. Cl. 277—235 R 7 Claims

Abrasion wear of piston rings and of the inner cylinder wall of an internal combustion engine is very low when the piston ring consists of cast iron of specified composition and a Rockwell hardness of at least C 40, and the cylinder wall consists of electrodeposited nickel having fine particles of silicon carbide or other very hard material dispersed therein so that the cylinder wall has a hardness of Rockwell A 70 – A 100.

3,731,942

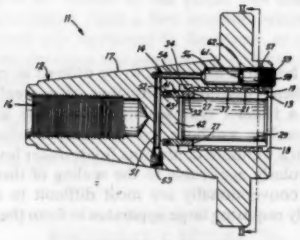
HYDRAULICALLY ACTUATED TOOL COLLET

James R. Buck, Richland, Mich., assignor to Buck Tool Company, Kalamozoo, Mich.

Filed Sept. 30, 1970, Ser. No. 76,884

Int. Cl. B23b 31/36

U.S. Cl. 279—4 2 Claims



An improved chuck construction, particularly for holding a work tool, comprising a housing and a gripping sleeve mounted on the housing for relative axial movement therebetween. The housing and the gripping sleeve are each provided with a plurality of circumferentially spaced cam rows, with each row including a plurality of axially spaced ramp-like cams. The cam rows on the gripping sleeve and on the housing coact with one another in response to relative axial movement therebetween for causing the sleeve to deform radially so as to grip a tool. A captive or closed fluid system cooperates with the sleeve for moving same axially relative to the housing, which system includes a manually actuated member, such as a set screw, for causing the pressure of the fluid within the system to vary so as to cause relative axial movement of the sleeve relative to the housing and so as to cause the sleeve to be radially deformed into gripping engagement with the tool.

3,731,943

SAFETY SKI BINDING SYSTEM

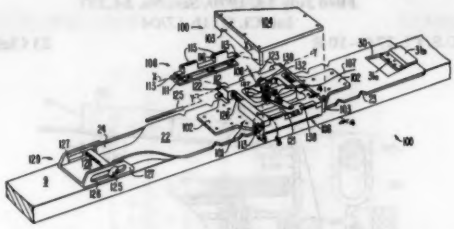
John D. Wilkes, 1024 Wisconsin Avenue, Washington, D.C.

Continuation-in-part of Ser. No. 838,873, July 3, 1969, Pat. No. 3,614,119. This application Oct. 18, 1971, Ser. No. 189,910

Int. Cl. A63c 9/08

U.S. Cl. 280—11.35 D 41 Claims

A safety ski binding system wherein a binding assembly is provided for rigid attachment to a ski boot and includes a pair of jaws rotatable on axes parallel to the length of the ski between a released position where the jaws are above the top surface of the ski and a locked position where the jaws engage a ski attachment means connected to the ski. The attachment means are in the form of a rigid or hinged plate or longitudinal strips. The hinge is provided at the forward end of the plate, and the hinged plate includes latch means for releasably



latching the rear end of the plate. The binding assembly includes means for moving the jaws from released to locking position and provision for stored energy release for movement of the jaws from locked to unlocked position when forces on the jaws exceed an adjustable force threshold.

3,731,944

FIXING SKI BOOTS TO SKIS

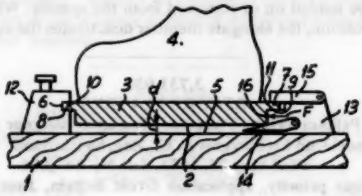
Georges Pierre Joseph Salomon, Annecy, France, assignor to S. A. Francois Solomon et Fils, Annecy, France

Filed March 30, 1971, Ser. No. 129,461

Claims priority, application Switzerland, April 8, 1970, 5163/70

Int. Cl. A63c 9/00

U.S. Cl. 280—11.35 C 8 Claims



A ski boot comprises a rigid substantially flat sole having a lower surface for walking and support surfaces, distinct from and above the lower surface, located at toe and heel ends of the sole. Bearing surfaces on toe and heel bindings cooperate with said support surfaces to hold the boot on a ski with said lower surface spaced apart from the upper surface of the ski.

3,731,945

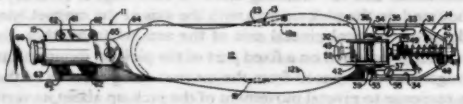
SAFETY SKI BINDING APPARATUS

Ralph S. Johnson, 907 Fontier Park Avenue, Cheyenne, Wyo.

Filed May 22, 1970, Ser. No. 39,927

Int. Cl. A63c 9/00

U.S. Cl. 280—11.35 T 8 Claims



Safety ski binding apparatus has lateral movement restraining structure operatively associated with the ski and ski boot for establishing a pivot intermediately of the heel and toe bindings about which the ski boot will turn to reduce the strain

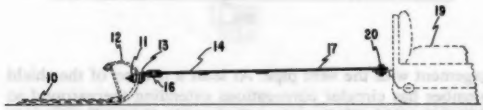
on the leg when the leg is twisted during skiing. An improved toe binding has a spring-loaded lever and clamp assembly which releasably holds the toe portion of the boot down against the top of the ski and restrains forward movement of the ski boot while permitting lateral movement of the toe portion about the intermediate pivot.

3,731,946

TORSIONALLY FLEXIBLE HITCH

Orville H. Westcott, 1115 West 10th Street, Sioux Falls, S. Dak.

Filed May 10, 1971, Ser. No. 141,543
Int. Cl. B62b *13/00*
U.S. Cl. 280—24 **2 Claims**



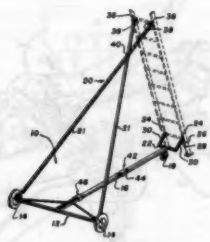
A tow bar for a toboggan or the like for use in connection with a snowmobile. The bar is flat and resilient whereby flexure is permitted, but the toboggan is restrained from tipping over.

3,731,947

LADDER TROLLEY

Lawrence A. Fontaine, 3035 Charles Street, Vancouver, British Columbia, Canada

Filed June 3, 1971, Ser. No. 149,652
Int. Cl. B62b *11/00*
U.S. Cl. 280—36 R **3 Claims**



A foldable trolley which can be attached to an extension ladder or to any other heavy ladder and provides a way of easily moving the ladder about on the job. The trolley consists of a wheeled and foldable frame which includes hooks for engaging certain rungs of the ladder so that the ladder can be wheeled about while in a substantially upright position. The trolley folds up when the ladder is in use.

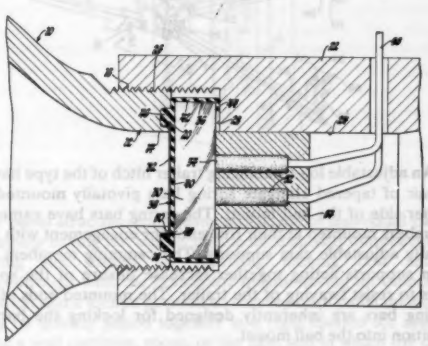
3,731,948

OCCUPANT RESTRAINT SYSTEM

Richard C. Risko, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1971, Ser. No. 204,159
Int Cl B60r *21/02*
U.S. Cl. 280—150 AB **3 Claims**

An occupant restraint system includes a pressure vessel providing a source of pressure fluid and having a cylindrical outlet neck including cylindrical inner and outer walls joined by a radial end wall provided with an axially outwardly opening continuous groove of generally rectangular cross section. A manifold communicates the pressure vessel with a diffuser and an inflatable occupant restraint cushion. The manifold includes a threaded inlet wall which is threaded on the threaded outer wall of the neck and which merges into the passage wall of the manifold across a radial wall. A cylindrical glass diaphragm has one face juxtaposed to the outlet opening of the neck and the groove in the end wall and an opposite face juxtaposed to the radial wall of the manifold. A seal of resilient material covers the one face of the diaphragm and the side wall thereof, and partially covers the other face. An integral



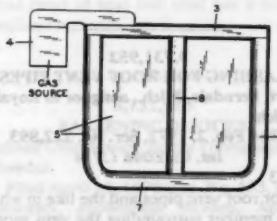
rib extends axially of the one face and is received within the groove in the end wall of the pressure vessel. The seal is compressed between the radial wall of the manifold and the end wall of the pressure vessel and the seal rib is compressed against the base wall of the groove. The seal rib is of lesser cross section than the groove and the leakage of pressure fluid between the seal and the end wall into the groove forces the radial outer wall of the rib into engagement with the radial outer wall of the groove. Detonators encased in stemming material seat against the other face of the glass diaphragm and are electrically fired to rupture the diaphragm.

3,731,949

FLAT BAG MADE OF TUBULAR SECTIONS

Donald G. Radke, Rochester, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed May 12, 1971, Ser. No. 142,658
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB **1 Claim**



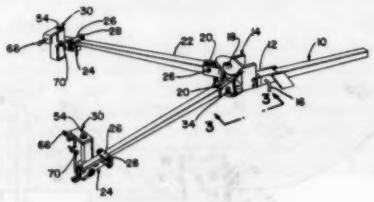
This invention relates to a bag inflated for automotive passenger restraint, said bag having a minimum area which is inflatable to extend the bag over the area it must extend across to protect the passenger.

3,731,950

ADJUSTABLE LOAD STABILIZING TRAILER HITCH

Harry Logan Burcham, Lodi, Calif., assignor to Valley Tow-Rite, Inc., Lodi, Calif.

Filed Aug. 4, 1971, Ser. No. 168,874
Int. Cl. B60d 1/06
U.S. Cl. 280—406 A 3 Claims



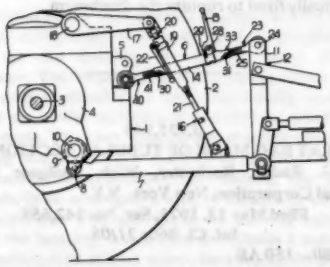
An adjustable load stabilizing trailer hitch of the type having a pair of tapered elongate spring bars pivotally mounted on either side of the ball mount. The spring bars have camming members mounted at their free ends for engagement with vertically adjustable cam supports. The camming members and cam supports acting together increase flexure of the spring bars to resist swaying of the trailer. The mounted ends of the spring bars are inherently designed for locking the bars in position into the ball mount.

3,731,951

ADJUSTABLE LINK THREAD CLEANER

Lawrence M. Gruenberger, West Allis, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 16, 1970, Ser. No. 98,560
Int. Cl. B60d 1/14
U.S. Cl. 280—461 A 10 Claims



An adjustable link having an internally threaded sleeve receiving an externally threaded extension member with automatic thread cleaning means to provide a freely running thread.

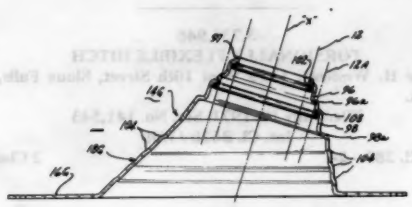
3,731,952

FLASHING FOR ROOF VENT PIPES

Bruce J. Elwart, Ferndale, Mich., assignor to Royal Seven Inc., Ferndale, Mich.

Filed Feb. 2, 1972, Ser. No. 222,893
Int. Cl. E04d 13/14
U.S. Cl. 285—3 7 Claims

A flashing for roof vent pipes and the like in which a frusto-conical shield member surrounding the vent pipe has an enlarged flat base flange engaging the rooftop surface and an upper portion provided with a plurality of concentric cylindrical stepped portions selectively diametered to fit varying pipe sizes, the smaller stepped portion being readily severed from the remainder so that the next larger stepped portion will fit a larger pipe, with O-ring seals having slightly smaller inner diameters than the inner diameters of the vent pipe engaging stepped portions being fitted adjacent thereto for sealing engagement with the vent pipe. At least a portion of the shield member has circular corrugations extending therearound so that the shield will flex to conform with slight differences in roof pitches, as well as to provide flexing required by expansion and contraction of the building structure.

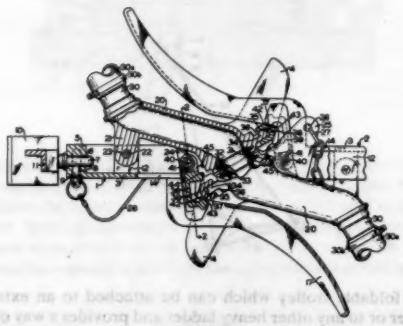


3,731,953

AUTOMATIC AIR HOSE CONNECTOR

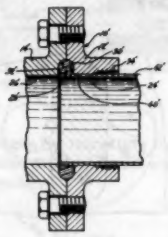
Fred Temple, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sept. 9, 1971, Ser. No. 178,904
Int. Cl. F16l 55/00
U.S. Cl. 285—12 9 Claims



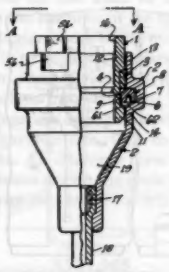
This invention relates to an automatic air hose connector for use on railway cars. This hose connector has a mating head which is provided with a removable hose nipple that has a hose secured to one end and a hose coupling formed on the other. When two adjacent cars, each having an automatic air hose connector, are coupled, while the nipples remain secured to the mating heads, the gaskets carried in the end of each hose coupling are moved into abutting relationship one with the other to form a seal therebetween so that a continuous conduit extends from one car to the other. Prior to coupling a car having an automatic air hose connector to a car without such a connector, the hose nipple is removed from the mating head so that, subsequent to the coupling of the cars, the hose coupling formed on the end of the nipple can be manually coupled to the hose coupling on the end of the hose at the adjacent end of the car without an automatic air hose connector to thereby form a continuous conduit from one car to the other.

3,731,954
FLUID COUPLING
Robert J. Haglund, 5990 Orchard Bend, Birmingham, Mich.
Filed Sept. 23, 1971, Ser. No. 182,952
Int. Cl. F16l 23/00, 13/08, 13/10
U.S. Cl. 285—12 1 Claim



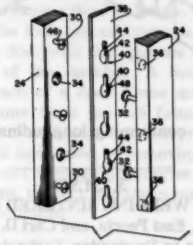
A fluid coupling comprising a pair of connected coupling members having registering passages extending therethrough with the passage in one of the coupling members having a threaded portion for connection to a threaded pipe and also having a smooth bore portion for bonding in the alternative to a non-threaded pipe of the same size as the threaded pipe. There is also provided an annular seal that seals the juncture of the coupling members and also provides a seal in addition to the bonded joint.

3,731,955
PUSH-PULL CONNECTOR HAVING A SHEAR-RESISTANT LOCKING RING
Adolph W. Borsum, and William K. Borsum, both of 521 Pacific Avenue, Solana Beach, Calif.
Filed Sept. 24, 1971, Ser. No. 183,582
Int. Cl. F16l 17/00
U.S. Cl. 285—111 12 Claims



A push-pull connector including conventional telescopically slidable male and female connector members each provided with an annular peripheral recess, the members being interlocked by a resilient U-shaped packing secured in one of the recesses and extending into an engaged position in the other recess. A disconnect ring, preferably mounted in this other recess, is slidably movable axially of the connector members to forcefully cam the packing out of its interlocking engagement to permit the connector members to be separated. Shear strength of the locking member is increased by specially forming the recess-engaging portion of the U-shaped packing. In particular, this portion is formed as a parallelogram and the arrangement is such that approximately one-half of the parallelogram projects into engagement with the other recess, the other half of the parallelogram remaining in the recess in which the packing is secured. Compressive forces produced by the normal tendency of the connector members to separate are applied in shear substantially along the diagonal of the parallelogram which, since it contains the maximum bulk of the packing, is capable of resisting the shear.

3,731,956
PANEL STRUCTURE AND THE LIKE WITH CONNECTING MEANS
William J. Hanley, P. O. Box 5758 N.S., Nassau, Bahamas
Filed Dec. 8, 1970, Ser. No. 96,139
Int. Cl. F16b 5/07
U.S. Cl. 287—20.926 10 Claims



A panel structure comprising a plurality of individual panel members having flat connector means disposed therebetween having slot means for receiving locking bolt means therethrough with the connector means having an unlocked position and a locked position so that separate panel members may be quickly joined together in a rigid fashion for assembling a wall partition, room, or the like, and in which the connector members may be disposed in an unlocked position so that the panel members may be quickly disassembled, when desired.

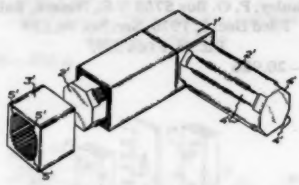
3,731,957
BALL JOINTS
Yasuo Uchida, Hamamatsu, Japan, assignor to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 1, 1971, Ser. No. 185,769
Claims priority, application Japan, Oct. 13, 1970, 45/89793
Int. Cl. F16c 11/06
U.S. Cl. 287—87 4 Claims

A ball joint comprising a ball stud having a spherical head, and a socket for receiving said spherical head of said ball stud. Said spherical head of said ball stud has a portion which is made of a resilient material.

3,731,958
FASTENING DEVICES
Adrian Gottfried Offenbroich, Sodra Forstadsgatan 49, 211 43 Malmo, Sweden
Filed April 14, 1970, Ser. No. 133,790
Claims priority, application Sweden, April 15, 1970, 5104/70
Int. Cl. F16b 7/00
U.S. Cl. 287—189.36 H 4 Claims

A device for the non-releasable fastening of a tube and a fastening body having a joining member which is adapted to

nest in the tube and has at least one longitudinal, recessed or bevelled portion which is permanently deformed upon en-



gagement with a conforming longitudinal projection of the tube.

3,731,959

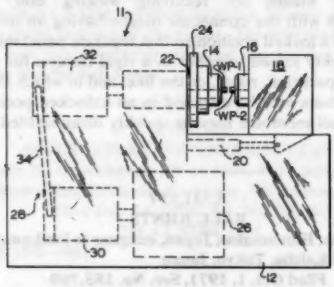
FRICTION WELDING SINTERED MATERIALS

Marion A. Calton, East Peoria, and Carl D. Weiss, Peoria, both of Ill., assignors to Production Technology Inc., Peoria, Ill.

Division of Ser. No. 747,779, July 19, 1968, Pat. No. 3,571,905. This application Aug. 12, 1970, Ser. No. 63,319

Int. Cl. F16b *11/00*

U.S. Cl. 287—189.36 B **3 Claims**



A friction welded assembly comprised of two workpieces bonded across a common weld zone interface and wherein at least one of the workpieces comprises a porous sintered metallic material.

3,731,960

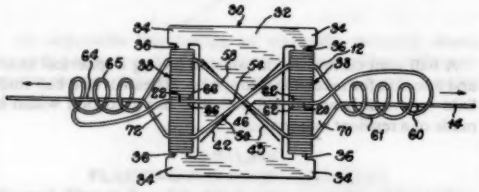
SELF-THREADING KNOT-TYING DEVICE

Samuel J. Pagano, 45 Ocho Avenue, Milltown, N.J.

Filed Feb. 9, 1971, Ser. No. 113,885

Int. Cl. D03j *3/00*

U.S. Cl. 289—17 **15 Claims**



A knot-tying device for use in tying a true barrel knot between first and second lines, the device including two pairs of diagonally opposite resiliently releasable line retaining means for holding crossed segments of the lines, and two further retaining means, each located between adjacent line retaining means of each of the two pairs. Preferably, the adjacent line retaining means of each of the two pairs are confronting coils located at opposite ends of a helical spring and each further retaining means is a pair of confronting coils located intermediate the opposite ends of the same helical spring.

3,731,961

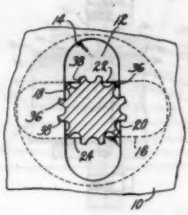
AUTOMOBILE BUMPER ASSEMBLY

Philip D. Becker, Southbury, Conn., assignor to Buell Industries, Waterbury, Conn.

Filed Dec. 16, 1971, Ser. No. 208,792

Int. Cl. F16b *7/00*

U.S. Cl. 287—189.36 F **4 Claims**



An automobile bumper assembly in which the bumper and support bracket are provided with elongated crossed recesses and a bolt having a ribbed shoulder is assembled into the central opening formed by the crossed recesses so that corresponding indentations are formed in the side edges of each recess to enable the assembly to resist movement of the bumper on the support in impact with an object.

3,731,962

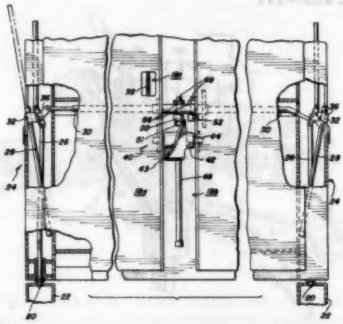
LATCH OPERATING MECHANISM FOR BULKHEADS

Samuel H. Enochian, Thornton, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 81,294, Oct. 16, 1970, Pat. No. 3,695,656. This application Nov. 4, 1971, Ser. No. 195,675

Int. Cl. E05c *1/06, 9/16*

U.S. Cl. 292—34 **9 Claims**



An actuator of multiple latches of a bulkhead is provided with improvement features that insures making the operator of the device cognizant of the condition of the latches, that prevents inadvertent swinging of a handle that could result in damage, that brings about improved movement of linkages that operate the latches, and which permits of reduced servicing costs in the event repair is required.

3,731,963

ELECTRICALLY ACTUATED LOCK MECHANISM

Raymond B. Pond, 195 Springfield Avenue, Greenfield Park, Quebec, Canada

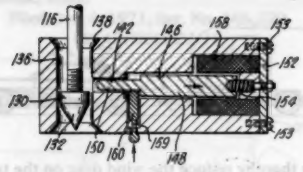
Continuation-in-part of Ser. No. 837,643, June 30, 1969. This application April 20, 1971, Ser. No. 135,571

Int. Cl. E05b *47/04, 65/19*

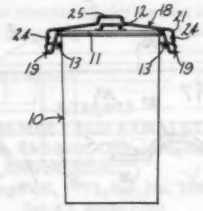
U.S. Cl. 292—144 **4 Claims**

A locking mechanism includes a tubular sleeve adapted to receive a shouldered projection extending from the closure

member, a spring biased plunger normally projecting into the projection seat to engage the projection. A solenoid is associated with the plunger for retracting the plunger from the tubular sleeve to release the projection when it is required to unlock the closure member.

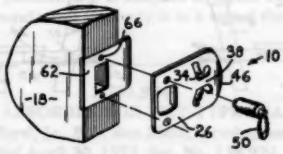


3,731,964
LOCK FOR GARBAGE CAN COVERS
Noel Hyde, 305 Park Road, Pleasant Grove, Ala.
Filed Nov. 26, 1971, Ser. No. 202,107
Int. Cl. B65d *45/30, 45/32*
U.S. Cl. 292—258 4 Claims



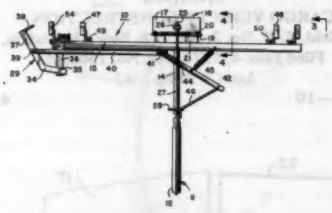
A lock for garbage can covers, which in one form is a strap which extends across the top of the can, engaging the cover, with loop formations on the ends of the strap which are adapted to fit within the confines of the handles carried by the garbage can or container, there being means on the outer leg of the loop releasably to engage the bases of the handles, thus to lock the cover in place. Specifically, the outer leg of the loop carries indentations into which the bases of the handles fit, and the loop is narrow enough to permit the same to be moved toward the garbage can, thus to release the handles from the indentations. An alternate form is provided in which the loop retaining means are on the ends of separately formed straps, which straps are secured to the top of the cover.

3,731,965
DOOR LOCK
Archie D. Adkison, Jr., R. R. 22, Parkville, Mo.
Filed Dec. 13, 1971, Ser. No. 207,478
Int. Cl. E05c *19/18*
U.S. Cl. 292—292 5 Claims



A lock for use with a door having a latch which is adapted to be received in a notch located in the door frame can be utilized either as a permanently-installed lock or as a portable lock that can easily be moved to various locations. A planar member is adapted to be disposed between the door frame and the door when the latter is in closed position. A laterally extending tab is disposed at a right angle to the planar member and is adapted to be received in the notch. A pair of slots in the member are mirror images of each other and diverge away from a divider element that lies in a horizontal plane passing through the tab. Each slot is configured to present a plurality of seats for receiving a keeper pin adjacent the door, when the latter is closed, to present a dead bolt lock. By simply turning the member 180° the lock can accommodate either a left or right-hand opening door with the opposite slot being utilized for each position of the member. A housing is normally disposed in the notch of a door frame and is permanently secured to the frame by a pair of fasteners. The planar member has a pair of arms which are adapted to be disposed on either side of the notch and by removing the housing and inserting the fasteners through appropriate openings in the aforementioned arms, the lock apparatus may be permanently mounted on the door frame.

3,731,966
APPARATUS FOR CHANGING FLUORESCENT LIGHTING TUBES AND THE LIKE
Steve Nagy, 248 15th Street, Richmond, Calif.
Filed May 10, 1971, Ser. No. 141,888
Int. Cl. H10k *3/32*
U.S. Cl. 294—20 8 Claims

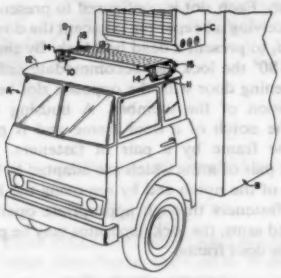


Apparatus for changing from the ground level fluorescent lighting tubes of suspended ceiling fixtures which are otherwise inaccessible for such change except from a ladder or scaffold. The apparatus includes an elongated pole having sufficient length to reach a ceiling fixture, and an elongated longitudinally extending carrier is mounted upon the pole so as to be manipulated thereby. A tube holder having a pair of jaws selectively movable between open and closed positions is mounted upon the carrier and extends upwardly therefrom. The holder is adapted to releasably receive a fluorescent tube for removal and replacement thereof, and when gripping such tube, supports the same in a generally horizontal longitudinally disposed orientation. A fixture stop is supported by the carrier adjacent one end thereof and it is movable with respect thereto and with respect to the holder in generally longitudinal directions between positions in which it is remote from a fixture and in engagement therewith to enforce longitudinal displacements thereof relative to the holder and any tube supported thereby so as to urge one end of the tube against a compression socket so as to force the same into a retracted position, thereby permitting the opposite end of the tube to be inserted into the socket therefor.

3,731,967
ROOF WALKWAY FOR TRUCK CABS
Donald L. Hughes, Berea, Ohio, assignor to Sealed-Unit Services, Inc., Cleveland, Ohio
Filed Aug. 25, 1971, Ser. No. 174,902
Int. Cl. B60r *9/04*
U.S. Cl. 296—1 R 3 Claims

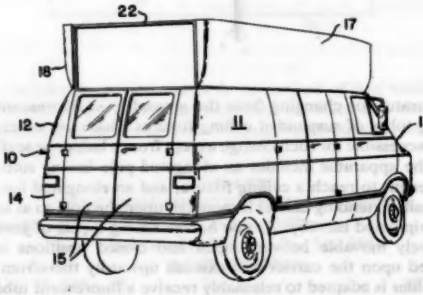
A walkway with universal mounting means for mounting on the top of truck cabs and the like of different sizes and shapes.

The walkway has a platform with receptacles at each end that receive a slidable bar on the top of each of four legs. The legs may be adjusted in the sockets to various spacings depending on the width of the cab. Mounting brackets are secured to opposite sides of the cab top usually at the curved edge portions



thereof so as to transfer the load of the walkway as directly as possible to the cab frame. The legs are connected to the brackets by bolts at connection points located along an axis at each end of the walkway so that any number of tilted positions of the mounting brackets can be accomodated depending on the curvature at the edge of the cab.

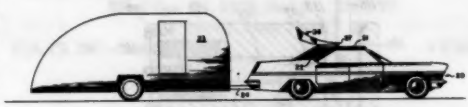
3,731,968
CARGO VEHICLE CONSTRUCTION
Robert Duffield, R. D. No. 2, Box 178, New Alexandria, Pa.
Filed June 4, 1971, Ser. No. 150,145
Int. Cl. B60p *3/42*
U.S. Cl. 296—10 **4 Claims**



A convertible van construction is provided having a body with a pair of opposed side walls and a pair of end walls, one of said walls having access means into the van interior, said side and end walls defining an open top of said body, a pair of roof members hinged to the top edges of the two opposed side walls for selectively opening and closing said open top of said body, said pair of roof members being of generally equal size and shape and seal means at the edges of said roof members which join on closing.

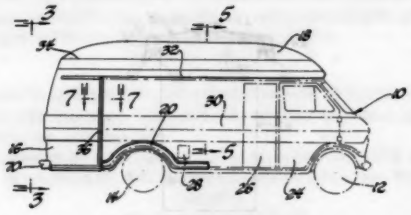
3,731,969
AERODYNAMIC DEFLECTOR
Johann T. Bildfell, London, Ontario, Canada, assignor to Trail-Air Scoop Limited
Filed May 12, 1971, Ser. No. 142,467
Claims priority, application Canada, Nov. 16, 1970, 098171
Int. Cl. B62d *35/00*
U.S. Cl. 296—1 S **10 Claims**

An aerodynamic body for disposition on the roof of an automobile is disclosed. The body is essentially wedge shaped with side skirts and having a curved rising surface for causing the wind to flow over and around a trailer being pulled by the



automobile to thereby reduce the wind drag on the trailer and improve trailer tracking during travel.

3,731,970
MOTOR HOME CONSTRUCTION
Ronald R. Frank, 24 Van Dyke, Marlette, Mich., and Raymond C. Frank, 4083 Second Street, Brown City, Mich.
Filed March 4, 1971, Ser. No. 121,062
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 R **12 Claims**



The means and method of constructing a motor home from a vehicle having a delivery van body style and which includes cutting away the old roof and the back end of the van body, providing an integral replacement roof and back end extension for attachment to the cut-away body with the new roof carried on the edges of the old one, over the drip molding, and the side edges of the extension having a fastening flange bonded to it that is attached to the inturned edge at the back end of the cut-off van body. Internal wall finishing is by use of full wall panels, formed and fitted for cupboard space, and frame extensions afford additional storage space.

3,731,971
FOLDING TABLE WITH BENCHES
Carl Sjogren, 169 Pearl St., Frewsburg, N.Y.
Filed Dec. 2, 1971, Ser. No. 204,213
Int. Cl. A47b *39/00*
U.S. Cl. 297—159 **1 Claim**

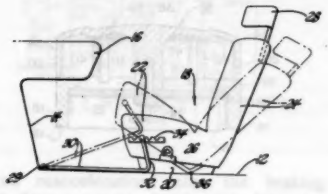
A table combined with a pair of benches is joined and articulated for collapse simplifying transport and storage.

3,731,972

SAFETY SEAT

Howard B. McConnell, Pontiac, Mich., assignor to Sam Allen & Son, Pontiac, Mich.

Filed Oct. 4, 1971, Ser. No. 186,329
Int. Cl. B60r 21/10
U.S. Cl. 297—216 3 Claims



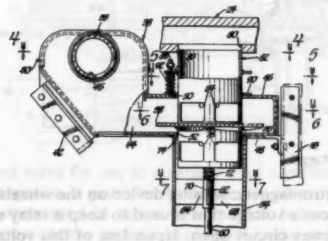
A safety seat construction for automotive and other vehicle use which includes mechanical means for causing the vehicle seat bottom to be raised at the front and the seat back to be tilted backwardly, and which includes in combination therewith a shoulder restraining device that is mounted on the seat back to hold a person against the seat back as it is tipped rearwardly.

3,731,973

VALVE ASSEMBLY FOR EXHAUST SYSTEM

Harold L. Kermode, Richfield, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 30, 1971, Ser. No. 185,128
Int. Cl. B60p 1/00
U.S. Cl. 298—1 H 2 Claims



A valve assembly for an exhaust system of a dump vehicle having a chassis supporting an operator's cab and a pivoted material-handling body. The valve assembly is carried by the chassis and adapted to direct exhaust gases upwardly into the hollow interior of the body when the latter is in a lowered load-retaining position and is adapted to direct exhaust gases toward the ground when the body is in a raised dumping position.

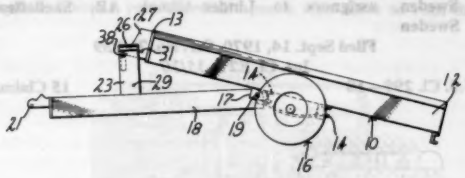
3,731,974

SHOCK ABSORBER FOR TILT-TYPE TRAILER

George T. Stafford, Jr., P.O. Box 2805, Birmingham, Ala.

Filed April 30, 1971, Ser. No. 138,974
Int. Cl. B60p 1/24
U.S. Cl. 298—17 R 4 Claims

Upstanding plates mounted between tilt type trailer bed and draw bar frame with adjacent surfaces of plates slidably engaging each other. At least one plate is carried by the draw bar frame and at least another one of plates is carried by the trailer bed. Adjustable means retains adjacent plates in frictional



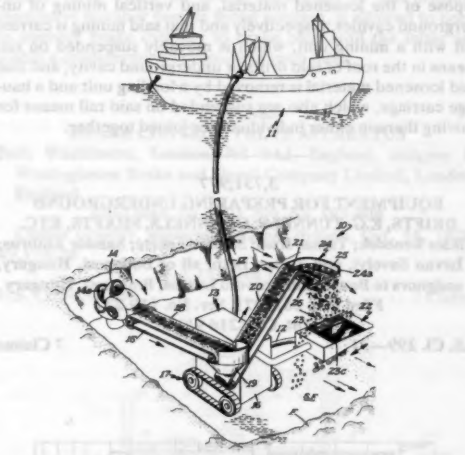
contact with each other and restrains relative movement between adjacent plates as trailer bed moves toward tilted position.

3,731,975

APPARATUS AND PROCESS FOR UNDERSEA MINING OF MINERAL BEARING SAND AND GRAVEL

Leonard A. Lindelof, Minneapolis, Minn., assignor to QVA Corporation, Minneapolis, Minn.

Filed Nov. 18, 1971, Ser. No. 199,986
Int. Cl. E02f 7/00
U.S. Cl. 299—8 5 Claims



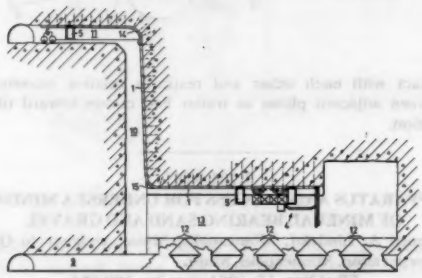
A process and mobile apparatus for the undersea mining of sand and gravel deposits containing gold particles and associated heavy minerals such as platinum, magnetite, etc., includes an excavating device which continuously excavates the sand and gravel material. Conveyor means receive the excavated sand and gravel and conveys the material to a discharge point which is located a predetermined distance above and a predetermined distance upstream from a screen type collection device. The predetermined difference in elevation and the downstream spacing between the collection device and the discharge point is so related to the ambient ocean current adjacent the ocean floor that separation of the sand and gravel discharged from the discharge point takes place as a result of the action of gravity and the subsurface ambient current acting on the material. The gold and associated metal particles (platinum, magnetite, etc.) and sand and gravel particles which are slightly coarser than the gold particles will be moved downstream by the ambient ocean current as the material falls and will be received by the collection device, while the sand particles will be carried downstream beyond the collection device, and the more coarse materials will fall upstream with respect to the collection device.

3,731,976

MINING METHODS USING EQUIPMENT SUSPENDED FROM ROOF-MOUNTED RAILS

Roland Granskog, and Rolf Degerman, both of Skelleftea, Sweden, assignors to Linden-Alimak AB, Skelleftea, Sweden

Filed Sept. 14, 1970, Ser. No. 71,939
Int. Cl. E21c 35/20
U.S. Cl. 299—18 15 Claims



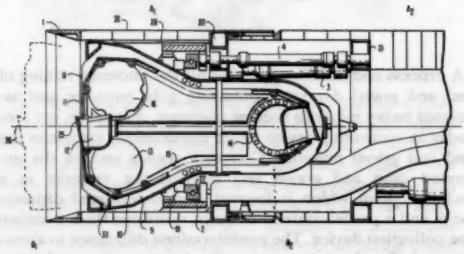
A method for mining in barren rocks or orebodies in order to bring about substantially horizontal drifts or upwardly inclined drifts having an inclination less than the angle of repose of the loosened material, and vertical mining of underground cavities, respectively and that said mining is carried out with a mining unit, which is movably suspended on rail means in the roof of said drifts or underground cavity, and that said loosened material is removed by a loading unit and a haulage carriage, which also are suspended on said rail means for moving thereon either individually or joined together.

3,731,977

EQUIPMENT FOR PREPARING UNDERGROUND DRIFTS, E.G. TUNNELS, CHANNELS, SHAFTS, ETC.

Miklos Benedek; Tamas Irsai; Sandor Fekete; Sandor Ambrus; Istvan Savolyi, and Zoltan Both, all of Budapest, Hungary, assignors to Banyaszati Tervezo Intezet, Budapest, Hungary

Filed Feb. 26, 1971, Ser. No. 119,227
Int. Cl. E21d 9/00
U.S. Cl. 299—31 7 Claims



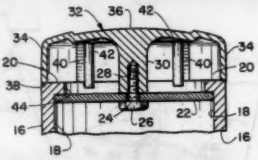
The invention relates to equipment for producing underground drifts, by means of which a much bigger drift driving progress can be realized than up till now, under practically optional soil conditions and groundwater conditions and in addition without any previous drainage. The propulsion of the lining units requires less demand on force and at the same time a perfect waterproofing can be achieved between the individual lining units and between the cutting shield and the adjacent lining unit.

3,731,978

HUBCAP FOR A VEHICLE WHEEL ASSEMBLY

Dalton M. Davis, Palos Verdes, Calif., assignor to Pyramid Enterprises, Inc., Torrance, Calif.

Filed Dec. 21, 1970, Ser. No. 100,097
Int. Cl. B60b 7/06
U.S. Cl. 301—108 SC 3 Claims



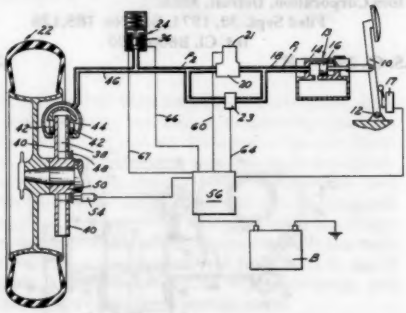
A hubcap for the central hub opening of a spider in a vehicle wheel assembly which employs a plurality of aligning pins to insure the exact positioning of the hubcap upon the spider.

3,731,979

BRAKE ANTI-SKID SYSTEM

Joseph J. Mikaila, Southfield, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 873,428, Nov. 3, 1969, abandoned. This application March 19, 1971, Ser. No. 125,985
Int. Cl. B60t 8/12
U.S. Cl. 303—21 F 14 Claims



An electromagnetic sensing device on the wheels of a vehicle produces a voltage that is used to keep a relay switch in a central power circuit open. Upon loss of this voltage due to stoppage of a wheel during skidding, the power circuit closes a solenoid valve in the hydraulic brake line, preventing the brake fluid pressure from dropping, and thus keeping the brake disc from rotating. Simultaneously, a square wave generator in the power circuit produces a square wave voltage to activate a solenoid coil operating a piston for automatically cycling the pressure in the brake line, maintaining the brake torque at or near the point of critical slip.

3,731,980

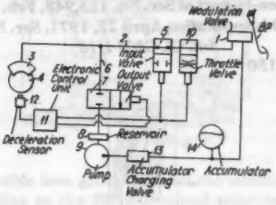
ANTISKID CONTROL SYSTEM

Werner Fink; Dieter Kircher, and Jutta Mittelbach, all of Frankfurt, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 10, 1972, Ser. No. 251,898
Claims priority, application Germany, May 27, 1971, P 21 26 391.2
Int. Cl. B60t 8/06
U.S. Cl. 303—21 F 7 Claims

There is disclosed a control valve arrangement for an antiskid control system which substantially eliminates the abrupt

pressure buildup on the brake circuit at the end of each antiskid control cycle when the vehicle wheel has reached a certain reacceleration value. A throttle valve is added to a conventional control valve arrangement so that upon achieving



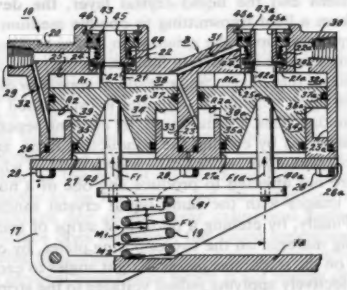
the desired reacceleration value the braking pressure gradually builds up on the brake circuit and thereby eliminates interfering signals in the control signals produced by the antiskid electronic control unit and vibrations of the vehicle itself.

3,731,981

CONTROL VALVE AND SYSTEM

Richard C. Bueler, Des Pere, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed May 21, 1971, Ser. No. 145,795
Int. Cl. B60t *8/18*
U.S. Cl. 303—22 R **46 Claims**



A control valve for use in a vehicle load condition responsive brake system is provided having a pair of proportioning members connected in series flow relation between a fluid pressure source and a pressure responsive brake and also subjected to variable forces directly related to vehicle load conditions. The proportioning members are generally operable to perform proportioning operations on the fluid pressure selectively applied from the fluid pressure source to the brake and responsive to the variable forces for varying the magnitudes of the applied fluid pressure at which the proportioning operations occur.

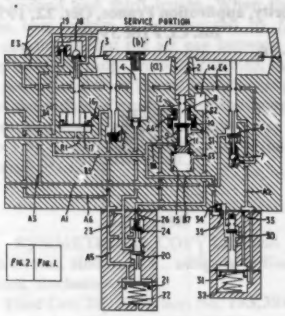
3,731,982

FLUID PRESSURE OPERABLE BRAKE CONTROL VALVES

Philip Norman Paginton, London, England, assignor to Westinghouse Brake and Signal Company, Limited, London, England

Filed May 28, 1971, Ser. No. 147,749
Claims priority, application Great Britain, June 9, 1970, 27,924/70
Int. Cl. B60t *15/22*
U.S. Cl. 303—33 **5 Claims**

A triple valve for fluid operable braking is provided with an additional emergency braking valve portion which has its own pressure responsive member which is responsive to at least a predetermined reduction of brake pipe pressure relative to quick action chamber pressure in a given period of time to open a brake cylinder valve to apply pressure to the brake cylinder from a reservoir and open a vent valve to vent the brake pipe, the vent valve and the brake cylinder valve being arranged in line and having between them an accelerated release valve which on return movement of the pressure responsive member past its initial position, is allowed to open to connect brake cylinder to brake pipe until the latter are within a predetermined pressure of each other.

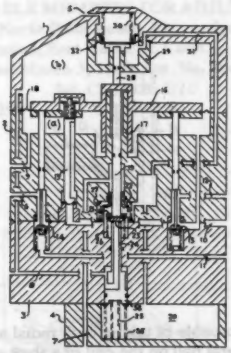


3,731,983

BRAKE CONTROL VALVE APPARATUS

Jack Washbourn, London, N1 9AJ, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Sept. 24, 1971, Ser. No. 183,408
Claims priority, application Great Britain, Oct. 16, 1970, 49,178/70
Int. Cl. B60t *15/18*
U.S. Cl. 303—33 **7 Claims**



A fluid operable triple valve for brake control means in which stability in the brake-applied equilibrium or lap position on the one hand and stability in the released position on the other hand are each provided by a spring acting to opposed movement of the pressure responsive diaphragm of the valve and fluid operable means being provided to remove the action of the spring in each case as soon as its thrust has been overcome by the pressure differential across the diaphragm.

3,731,984

MAGNETIC BEARING BLOCK DEVICE FOR SUPPORTING A VERTICAL SHAFT ADAPTED FOR ROTATING AT HIGH SPEED

Helmet Habermann, 2 Allee Principale, Foret de Vernon par 27, France

Filed Oct. 21, 1971, Ser. No. 191,258
Claims priority, application France, Oct. 22, 1970, 7038162
Int. Cl. F16c 39/06
U.S. Cl. 308—10 11 Claims

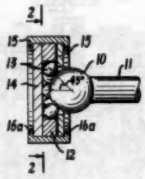
A shaft is suspended by upper and lower bearing blocks of the magnetic type. The upper and/or lower blocks are provided with a detector to sense when the shaft tends to leave a coaxial position in the associated block and a correction signal is generated and applied.

3,731,985

BALL BEARINGS

Albert Martin De Gaeta, 133 84th Street, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 759,560, Sept. 13, 1968, abandoned. This application Feb. 24, 1971, Ser. No. 118,257
Int. Cl. F16c 9/06
U.S. Cl. 308—194 12 Claims



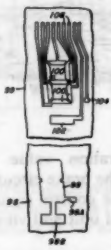
A ball bearing capable of taking both radial and axial loads comprises an integral ball on the end of a shaft engaging a full circular complement of balls running in a cylindrical outer race ring and confined axially by end plates at opposite ends of the outer race ring. The outer race ring and end plates are held in an outer case formed of metal having a lower modulus of elasticity than the outer race ring and end plates. A second bearing system comprises a shaft fixed axially on at least one end of a hollow cylinder in which two balls are confined. A finger extends through an opening in the side wall of the cylinder and between the two balls to take axial thrust on the shaft in either direction. The shaft is rotatably supported by radial bearings.

3,731,986

DISPLAY DEVICES UTILIZING LIQUID CRYSTAL LIGHT MODULATION

James L. Fergason, Kent, Ohio, assignor to International Liquid Xtal Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 113,948, Feb. 9, 1971, abandoned. This application April 22, 1971, Ser. No. 136,441
Int. Cl. G02f 1/18
U.S. Cl. 350—150 11 Claims



Optical display devices for converting electrical intelligence into optical images with the use of a shutter device comprising a layer of liquid crystal material sandwiched between opposing parallel plates coated with transparent conducting films. These plates, with the liquid crystal material therebetween, are disposed between and parallel to a pair of polarizers such that when an electrical potential is established across the conducting films and the liquid crystal layer, the device will change from a light transmitting to opaque medium, or vice versa, depending upon the orientation of the two polarizers. By forming the two conducting films in the shape of a desired optical image, that image can be made to appear or disappear, depending upon whether a potential is established between the conducting films. Furthermore, by creating separate conducting areas, as by etching the conducting films, any given number of conductive regions can be switched ON while other regions are not affected to produce any one of a number of different images with the same liquid crystal sandwich assembly. Finally, by etching a pattern of strips of transparent conducting material on the two opposing plates, by orienting the strips on the respective plates at right angles to each other, and by selectively applying pulsed voltages to the strips on the respective plates, the area of liquid crystal layer can be scanned point by point to produce with the same display any one of a number of optical images such as numerals, letters or the like. The invention has particular utility in computer and calculator read-outs, for example, since the display can be energized at a voltage level compatible with that used to drive the integrated circuitry used in such devices without the necessity for relatively high voltage driving circuitry.

3,731,987

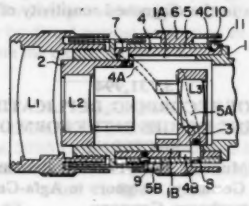
ZOOM LENS MOUNT ASSEMBLY WITH MEANS FOR CLOSE-UP FOCUSING

Yozo Iida, 786 Izuni Komae-machi, Kitatama-gun, Tokyo, and Hideyo Nozawa, 2-256 Yohga-machi Tanagawa, Setagaya-ku, Tokyo, both of Japan

Filed Aug. 13, 1971, Ser. No. 171,530
Claims priority, application Japan, Aug. 18, 1970, 45/71709
Int. Cl. G02b 7/10
U.S. Cl. 350—187 6 Claims

A zoom lens assembly includes a focusing lens system, a magnification varying lens system consisting of two movable lens groups, and an image forming lens system. Movement of an operating ring in the assembly simultaneously moves the

two movable lens groups according to a predetermined relationship. The operating ring also adjusts the distance between



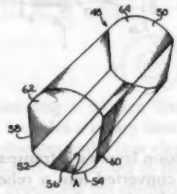
the two movable lens groups so that the simultaneous movement according to the predetermined relationship effects a zooming action or achieves focusing for ultra-short distances.

3,731,988

MAGNIFYING LENS DEVICES

Robert D. Lynch, 3520 Fifth Avenue, Los Angeles, Calif.

Filed Aug. 27, 1971, Ser. No. 175,499
Int. Cl. G02b *3/06, 25/00*
U.S. Cl. 350—188 **5 Claims**



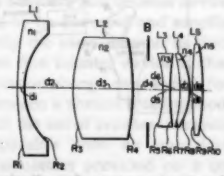
Magnifying devices for magnifying newsprint and the like having a generally cylindrical shape with one or more flattened areas parallel to the axis of the cylinder. The magnifying devices are of a transparent material with smooth and clear cylindrical surfaces and with at least one flattened surface having a frosted like appearance. The magnifying devices are used by placing the frosted surface against the newsprint or similar matter to be magnified and the magnified matter is viewed through one of the clear cylindrical surfaces. The frosted surface does not affect the visual appearance of the matter being magnified and creates a magnifying device of interesting physical appearance which is not readily observably scratched on the frosted surface. An alternate shape utilizing such a frosted surface is also disclosed.

3,731,989

WIDE ANGLE PHOTOGRAPHIC LENS SYSTEM

Yoshiyuki Shimizu, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 9, 1971, Ser. No. 206,358
Claims priority, application Japan, Dec. 15, 1970, 45/111286
Int. Cl. G02b *9/60*
U.S. Cl. 350—216 **3 Claims**



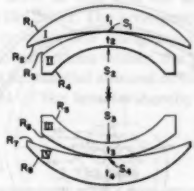
A wide angle photographic lens system comprises five single lenses and provides for a relative aperture of F/2.8, an angle of field of 62° and a back focus about 1.1 times as long as the focal length. As viewed in the direction of travel of light, the first of the five lenses is a negative meniscus lens convex to the object side of the system, the second lens a positive biconvex lens, the third lens a negative biconcave lens, the fourth lens a positive meniscus lens concave to the object side, and the fifth lens a positive biconvex lens. An aperture stop is interposed between the second and third lenses. When the total focal length of the lens system is represented by *f*, the system satisfies the conditions that the air gap between the first and second lenses be in the range from 0.2*f* to 0.6*f*, that the air gap between the second and third lenses be in the range from 0.15*f* to 0.25*f*, that the radius of curvature of the image-facing surface of the second lens have an absolute value in the range from 0.9 *f* to 1.5*f*, and that the back focus of the system be in the range from 0.9*f* to 1.2*f*.

3,731,990

SYMMETRICAL COPY LENSES

Lynn L. Van Orden, Holley, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 28, 1971, Ser. No. 193,289
Int. Cl. G02b *9/36, 17/08*
U.S. Cl. 350—221 **16 Claims**



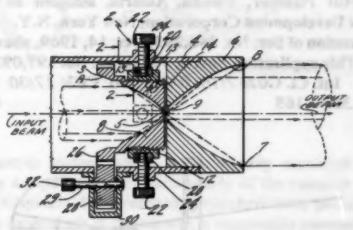
A series of four element photographic lenses for use at or near unity magnification, the lenses being in the form either of four elements in a symmetrical pattern or two elements and a mirror.

3,731,991

REFLECTING MEANS FOR BEAM CONTROL UTILIZING MOVABLE MEMBERS FOR ADJUSTMENT

Joe F. Arnold, North Palm Beach, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed March 3, 1969, Ser. No. 804,385
Int. Cl. G02b *5/10*
U.S. Cl. 350—294 **4 Claims**



A reflecting device having a housing with a fixed body and a second movable body mounted thereon, each body having a reflecting passage means extending therethrough with each passage having an axis. Said second movable body being mounted so that the axes of each passage means can be aligned and the distance between the fixed body and movable

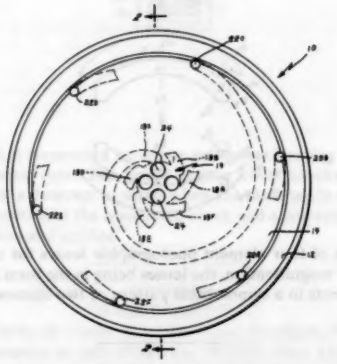
body can be controlled. Each reflecting passage has a small diameter opening and a large diameter opening intersecting the sides of its respective body. In their mounted position the small diameter openings face each other. The surface of the reflecting passage means of said second movable body being formed so that an input beam entering the large diameter opening will have the rays of the beam focused so as to pass through the small diameter opening and have the focal point lie outside the first passage. The surface of said reflecting passage means of said first body being formed as a reflecting surface so that the beam leaving the focal point will have the rays deflected to form a collimated beam of a different diameter than that of the input beam. When this device is used as an aerodynamic window in a gas dynamic laser, the output beam can be of the same diameter as the input beam.

3,731,992

SPIRAL GROOVED LIQUID COOLED LASER MIRROR

Dennis N. Mansell, Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed April 6, 1972, Ser. No. 241,560
Int. Cl. G02b *5/08*
U.S. Cl. 350—310 **4 Claims**



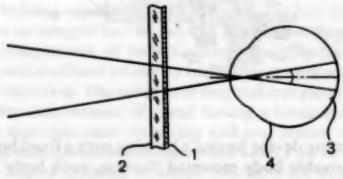
A liquid cooled laser mirror having a mirror structure and a cover. A plurality of spiral grooves are located within the mirror structure while entrance and exit ports are located within the cover. Liquid enters through the cover entrance ports, circulates through the spiral grooves, and exits through the cover exit ports thereby cooling the mirror.

3,731,993

LENS MATERIAL FOR REDUCING EFFECTIVE COLOR VISION

Fritz Artur Piringer, Vienna, Austria, assignor to National Patent Development Corporation, New York, N.Y.

Continuation of Ser. No. 866,293, Oct. 14, 1969, abandoned. This application Nov. 9, 1971, Ser. No. 197,092
Int. Cl. G02c *7/10*; B43d *5/06*; C03c *17/00*
U.S. Cl. 351—165 **6 Claims**



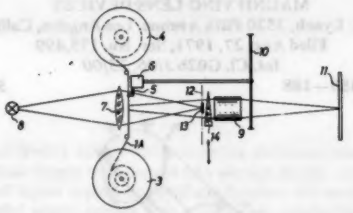
A spectacle lens is provided for a person with deficient color vision, the lens having a support with a transparent mosaic on the support constituted by a plurality of juxtaposed small color filter regions of different colors and respective spectral transmission factors which differ in magnitude in inverse proportion to the diagnosed sensitivity of the intended user.

3,731,994

METHOD OF RECORDING, DUPLICATING AND REPRODUCING IMAGES IN THE FORM OF RELIEF PATTERNS

Richard Wick, Munich, and Friedrich Bestenreiner, Grunwald, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed July 22, 1971, Ser. No. 165,150
Claims priority, application Germany, July 25, 1970, P 20 37 038.1
Int. Cl. G03b *19/18, 21/32*
U.S. Cl. 352—38 **13 Claims**



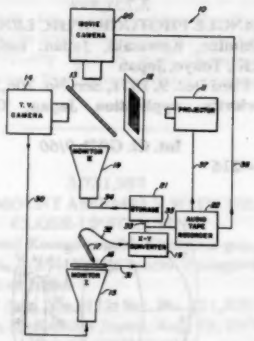
The exposed emulsion layer on a transparent carrier of motion picture film is converted into a relief pattern which is thereupon transferred onto a master record. The master is used for the making of duplicate films and the images represented by relief patterns on the duplicate films are reproduced by a Schlieren process or a phase contrast process.

3,731,995

METHOD AND APPARATUS FOR PRODUCING ANIMATED MOTION PICTURES

Leonard Reiffel, Chicago, Ill., assignor to Instructional Dynamics, Inc., Chicago, Ill.

Filed Oct. 29, 1970, Ser. No. 84,964
Int. Cl. G03b *15/00*
U.S. Cl. 352—87 **9 Claims**



An electrical-optical system for displaying background images, superimposing manually generated animated drawings electronically on such background images, and recording the

composite double images on a movie film. The background images initially are reproduced optically or electronically in order to superimpose the animated drawings thereon in exact registration. The background images recorded on the movie film are made by direct optical projection to avoid distortion produced within the electronic system.

3,731,996

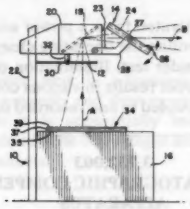
ANIMATED DISPLAY SYSTEM

Anthony Siksai, 2705 Lahser Rd., Bloomfield Hills, Mich.

Filed Dec. 27, 1971, Ser. No. 211,861

Int. Cl. G03b *21/32*

U.S. Cl. 352—87 **14 Claims**



A system for animating a picture illuminated by a light source. The system includes a rotary sheet of material having linearly oriented molecules and a lens element of optically inactive material angularly positioned in the path of light from said light source for producing the animation.

3,731,997

FILM COUNTER DEVICE FOR MOTION PICTURE CAMERAS

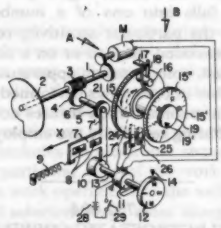
Yozo Iida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sept. 29, 1971, Ser. No. 184,783

Claims priority, application Japan, Sept. 30, 1970, 45/96786

Int. Cl. G03b *21/36*

U.S. Cl. 352—91 **6 Claims**



A motion picture camera film counter device which enables film once exposed to be rewound and supplied for a second exposure by exactly the same amount as that subject to the first exposure. The film counter device is characterized by a normal-reverse rotation change-over switch for changing over a motor circuit between a normal rotation mode and a reverse rotation mode with the aid of brushes connected in the motor circuit and cooperable with an electrically conductive member and its insulators provided on a counter member mounted for rotation on a shaft member, the counter member being engaged with and disengaged from a clutch member in response to the mode of the change-over switch.

3,731,998

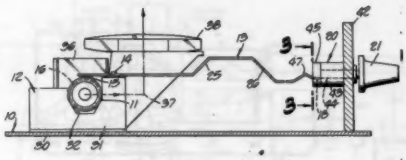
REMOTE FOCUSING ASSEMBLY

Hans Graafmans, Huntington Beach, Calif., assignor to Technicolor, Inc., Hollywood, Calif.

Filed May 14, 1971, Ser. No. 143,447

Int. Cl. G03b *3/00*

U.S. Cl. 352—140 **6 Claims**



There is disclosed herein a remotely operable focusing assembly for motion picture projectors and the like. In certain types of motion picture projectors and motion picture viewers, the placement of the optical system and projector lens is such that it is difficult to provide a suitable linkage or arrangement for moving the lens for focusing purposes. The present assembly includes a relatively simple pivotally mounted arm with an eccentric drive at one end for moving a relatively short-throw lens at the other. The arrangement is such that the arm may be bent or otherwise disfigured so as to pass over, under, or around obstructions within the projector. The arrangement allows a substantial amount of eccentric rotation in obtaining full travel of the lens to thereby allow fine adjustment of focus.

3,731,999

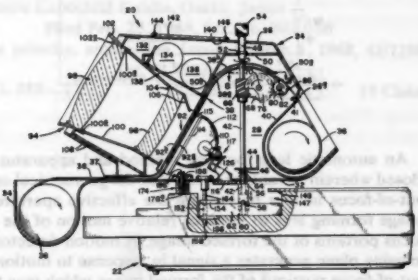
FILMSTRIP VIEWER ATTACHMENT FOR TAPE RECORDER

Daniel B. Ventre, 24 Anderson Street, Stamford, Conn.

Filed March 4, 1971, Ser. No. 121,030

Int. Cl. F03b *31/06*

U.S. Cl. 353—18 **13 Claims**

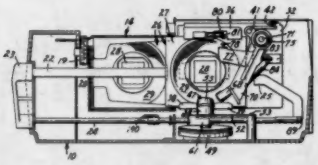


A filmstrip viewer which is removably mounted to and driven by a tape recorder, particularly of the cassette type, to provide a system for presenting synchronized pictures and sound. A drive shaft in the viewer is removably connectable to and driven in synchronism with the spool of a tape cassette, cartridge or reel loaded on the tape recorder. The drive shaft is geared to sprocket wheels which advance the filmstrip through the viewer, and the gearing provides for frame-by-frame advancement with an appropriate time delay for the incorporation of the sound presentation. The viewer may also be provided with an improved lamp socket, an automatic illumination switch, and with manual means for advancing and adjusting the filmstrip position.

3,732,000
SOUND-SLIDE PROJECTOR

Leland W. Annett, Crystal, and George J. Wallin, St. Paul, both of Minn., assignors to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Filed March 30, 1972, Ser. No. 239,460
Int. Cl. G03b 31/06, 21/00
U.S. Cl. 353—19 7 Claims

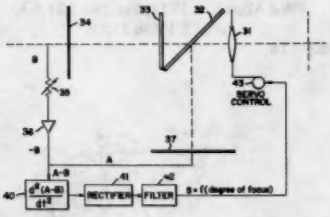


A sound-slide projector for use with a sound-slide, wherein the sound media is a thin, flexible disk having a magnetizable coating on one face which disk is supported at a central opening therethrough on the sound-slide frame for rotation about the photographic slide and wherein a tapered capstan and a pressure roller are provided to drive the disk between their peripheries while a magnetic transducer is moved radially with respect to the disk.

3,732,001
AUTOMATIC LENS FOCUSING METHOD AND APPARATUS

William J. Harrison, 116 Longfellow Road, Mill Valley, Calif.

Continuation of Ser. No. 691,405, Dec. 18, 1967, abandoned. This application Feb. 22, 1971, Ser. No. 117,815
Int. Cl. G03b 3/10
U.S. Cl. 353—101 9 Claims



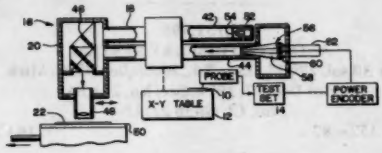
An automatic lens focusing method and apparatus is disclosed wherein advantage is taken of the geometrical optics of out-of-focus images by varying the effective aperture of an image forming lens to produce relative motion of the out-of-focus portions of the formed image. A motion detector at the imaging plane generates a signal in response to motion of the out-of-focus portions of the formed image which may then be used for control of the image-forming lens to provide optimum focusing or to provide range finding information.

3,732,002
PHOTOGRAPHIC RECORDER FOR DIE SORTING SYSTEM

Mordechai Wiesler, 6 Carmel Circle, Lexington; Virgil Martinonis, Eastern Point Boulevard, Gloucester, and John S. MacIntyre, 18 William Road, Lynnfield, all of Mass.

Division of Ser. No. 785,209, Dec. 19, 1968, Pat. No. 3,583,561. This application Nov. 27, 1970, Ser. No. 93,111
Int. Cl. G03b 27/00
U.S. Cl. 355—1 3 Claims

An electro-optical encoding device for photographically recording a coded signal representing test data of the operational characteristics of a semiconductor die. Individual light sources are optically coupled and focused towards a beam splitter through a bundle of light pipes which taper towards the beam splitter. Each light source is selectively energized by

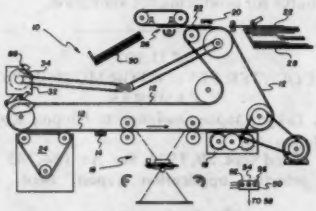


command signals generated from a power source in response to data signal representing the operating characteristics of the semiconductor die under test. Illumination of certain one or more of the light sources results in various code combinations which are optically coupled to and recorded on a film.

3,732,003
ELECTROSTATOGRAPHIC COMPENSATION APPARATUS

Conrad Altmann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1971, Ser. No. 213,013
Int. Cl. G03g 15/00
U.S. Cl. 355—3 9 Claims



In an electrostatographic copying device of the type which utilizes a replaceable web having a particular sensitivity response which falls into one of a number of sensitivity response ranges, the particular sensitivity response range of each web being encoded thereon or on a cartridge in which the web is disposed, compensation apparatus adapted to alter any one of a number of operations performed with respect to a utilized web, in a manner which insures comparable copies when webs of differing sensitivity are employed from time to time.

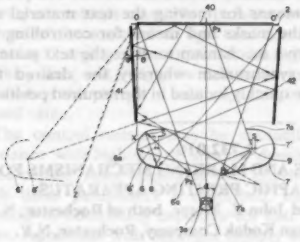
3,732,004
VERTICAL ELECTROSTATIC COPYING MACHINE WITH GHOST FREE IMAGE PROJECTING SYSTEM

Yorio Yamanoi, and Masahiro Maeda, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 10, 1970, Ser. No. 70,976
Claims priority, application Japan, Sept. 11, 1969, 44/86371
Int. Cl. G03g 15/22
U.S. Cl. 355—3 6 Claims

A vertical electrostatic copying machine includes a vertical illuminating chamber provided at its top with a horizontal original supporting window and at its bottom with a lens which focuses an image on a vertical plane by way of a mirror. The original is illuminated by a pair of curved reflector backed op-

posite lamps at the lower part of the chamber and planar specular reflectors depending from opposite edges of the window and so inclined as to reflect the light from the lamps in a manner to prevent ghost images. The copy paper is drawn from a source thereof forward of the upper part of the illu-



minating chamber and is advanced along a loop path downwardly, rearwardly and then upwardly to discharge, and along the path it is sequentially cut, charged, exposed, developed and dried. The copy paper source may be a roll or a stack of precut sheets.

3,732,005

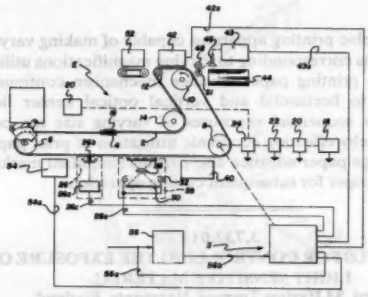
INTEGRATED CIRCUIT SEQUENCER

Gareth Aeron Lloyd, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 12, 1972, Ser. No. 217,093

Int. Cl. G03g *15/00*

U.S. Cl. 355—14 **3 Claims**



Electrophotographic copying apparatus is disclosed having an elongated electrosensitive web defining a plurality of selectable image areas and movable along an endless path relative to a plurality of actuable work stations disposed along the path. Each work station is operative when actuated to perform a work operation on a selected image area of the web. The apparatus includes an electronic sequencer for sequentially actuating particular ones of the work stations to cause them to perform work operations on the web in timed relation to movement of selected image areas along the path respectively. The sequencer includes a shift register having a plurality of states, the state at any particular time being a function of the position of the web along the path and the number of copies to be made. The sequencer further includes means for producing a first signal having a frequency proportional to the rate of movement of the web along the path, a counter responsive to the first signal and having a plurality of states, the state at any particular time manifesting the total cumulative number of first signals, and decoding networks responsive to particular states of the shift register and particular states of the counter for sequentially actuating and de-actuating the actuable work stations in timed relation to movement of the web past predetermined positions along the endless path to effect sequential operation of such work stations with respect to selected image areas.

3,732,006

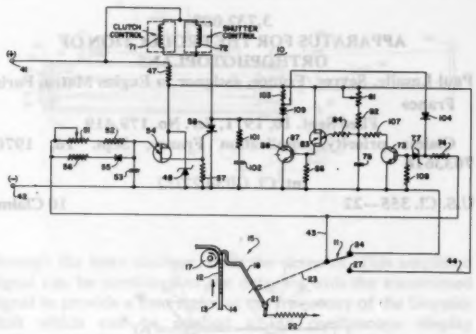
CONTINUOUS MICROFILMER TIMING CIRCUIT

Dwight T. Howard, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 24, 1971, Ser. No. 146,232

Int. Cl. G03b *21/00*

U.S. Cl. 355—14 **5 Claims**



For use in a continuous microfilmer, a timing circuit includes an SCR gate effective when turned on and off for respectively energizing and de-energizing shutter and clutch coils of such microfilmer. The timing circuit further includes a switch which, when engaged by the lead edge of a document to be microfilmed, causes a first charging circuit, after a predetermined time delay, to turn on the SCR thereby energizing the coils. When the switch disengages from the document a second charging circuit is energized which, after another predetermined time delay, causes the SCR to turn off thereby de-energizing the shutter and clutch coils.

3,732,007

METHOD AND DEVICE FOR INSTANT RECORDING OF LIGHT IMAGES WHILE OBSERVING SAID LIGHT IMAGES

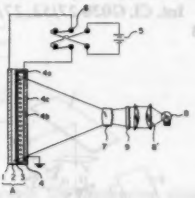
Teizo Kushima, Osaka; Susumu Tanaka, Otsu-shi, and Kuniki Seino, Amagasaki-shi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1969, Ser. No. 802,056

Claims priority, application Japan, March 1, 1968, 43/12903

Int. Cl. G03g *13/04*

U.S. Cl. 355—17 **19 Claims**



The present invention relates to a method and a device for instant recording of light images while observing said light images which makes use of a three layer photosensitive plate having photopermeability and serving as a rear screen so as to enable projected light images to be visible, and composed of a high insulating layer, a photosensitive layer having the P.I.P. character, and a conductive layer; the exposure for uniformly irradiating the overall surface of the photosensitive plate is given from one face thereof and simultaneously the voltage of an optional polarity is impressed on the photosensitive plate to

give an overall uniform charge thereto, and light images are irradiated onto the photosensitive plate and thus, while observing the light images effected on the rear screen, the voltage of opposite polarity to said polarity is impressed at any time desired to give the exposure of light images and thereby recording of light images is effected onto said photosensitive plate.

3,732,008

APPARATUS FOR THE PRODUCTION OF ORTHOPHOTOPLANS

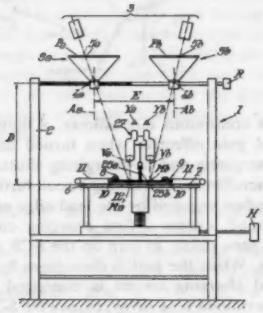
Paul Lasalle, Sevres, France, assignor to Eugins Matra, Paris, France

Filed Sept. 10, 1971, Ser. No. 179,419

Claims priority, application France, Sept. 16, 1970, 7033616

Int. Cl. G03b 27/32

U.S. Cl. 355—22 **10 Claims**



The apparatus comprises an optical projection device for a pair of stereoscopic photographs and a support for a sensitive surface, a receiving device and a device for the successive exposure of adjacent zones of the sensitive surface. The receiving device comprises two distinct visible marks *Ma*, *Mb*. Optical means with two sighting axes enable a stereoscopic reconstitution of a space mark and of a portion of the subject. The mark *Ma* is constituted by an aperture. The apparatus is useful for producing orthophotoplans in colors.

3,732,009

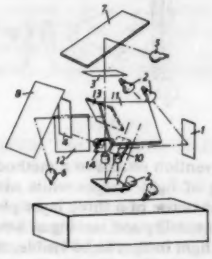
PHOTO-COMPOSING MACHINES

George William Callum, Cannington Town London, England, assignor to Lamson Paragon Limited, London, England

Filed Oct. 15, 1971, Ser. No. 189,624

Int. Cl. G03b 27/52, 27/70

U.S. Cl. 355—43 **4 Claims**



This invention is concerned with a photocomposing machine and is more particularly concerned with a photocomposing machine for use in preparing printing plates for use in a machine for printing business forms. In such a machine text matter is prepared on a master sheet which is mounted on a carrier which moves through the machine in such a way that the matter to be projected is correctly positioned in the photocomposing machine. Mask mechanism are also provided in the photocomposing machine and these mask mechanism have to be moved at the same time as the carrier. The present invention provides means for moving the text material and means for moving the masks and means for controlling the movement of the drive mechanism to drive the text material and the masks in synchronism whereby the desired text material can be more quickly located in the required position.

3,732,010

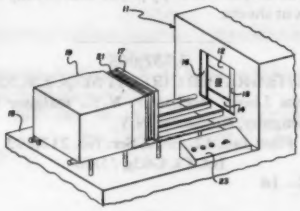
PAPER ADVANCE AND MARKING MECHANISMS FOR PHOTOGRAPHIC PRINTING APPARATUS

James E. Harter, and John E. Morse, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 20, 1971, Ser. No. 181,685

Int. Cl. G03b 27/32, 27/52

U.S. Cl. 355—64 **10 Claims**



Photographic printing apparatus capable of making varying sizes of prints corresponding to varying magnifications utilizes a two stage printing paper advance mechanism continually referenced to horizontal and vertical optical center lines whereby the sequential exposures of varying size are contiguous thereby effecting economic utilization of print paper. The two stage paper advance also permits simplified marking of the print paper for subsequent cutting operations.

3,732,011

APPARATUS FOR CONTROLLING THE EXPOSURE OF LIGHT SENSITIVE MATERIAL

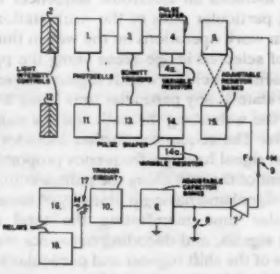
Cyril Hansard, 84 Harlow Terrace, Harrogate, England

Filed Sept. 17, 1971, Ser. No. 181,472

Claims priority, application Great Britain, Sept. 24, 1970, 45,483/70

Int. Cl. G03b 27/76

U.S. Cl. 355—68 **29 Claims**



Apparatus for controlling the exposure of a photosensitive material to light. The apparatus includes an electrical pulsing circuit capable of producing voltage pulses, a photocell

responsive to the intensity of the light to control the pulsing circuit so that the frequency of the pulses is dependent on the intensity of the light, a capacitor which is manually adjustable to a predetermined value in accordance with the quantity of light needed for desired exposure of the material, a control resistor, through which the pulses may be applied to charge the capacitor, which is manually adjustable in accordance with a given parameter, a manually operable switch for initiating exposure of the material to light and simultaneously for commencing charging of the capacitor through the control resistor by the pulses, and a trigger which is operative to stop the exposure when the charge in said capacitor reaches the predetermined value.

The control resistor may be manually adjustable in accordance with highlight or shadow density of graphic matter to be copied. Also, apparatus with interlinked adjustment for both these parameters is described, such apparatus being capable of controlling exposure for half tone and line negatives. Apparatus with highlight density control only for controlling exposure in contact printing boxes is also described.

3,732,012

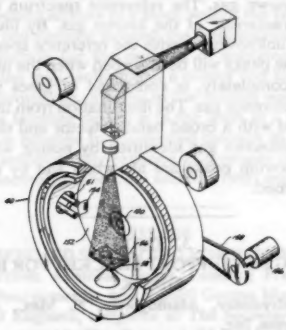
HIGH CONTRAST IMAGE DEVELOPMENT APPARATUS

Alfred F. Kaspaul, and Erika E. Kaspaul, both of Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 71,043, Sept. 10, 1970, Pat. No. 3,671,238, which is a continuation-in-part of Ser. No. 839,271, July 7, 1969, Pat. No. 3,660,087. This application Oct. 12, 1971, Ser. No. 188,050

Int. Cl. G03b *27/00*

U.S. Cl. 355—133 **11 Claims**



Apparatus for improving the contrast of images formed by depositing metal vapor atoms on actinic ray imagewise-exposed nucleated surfaces of nucleation recording medium. Optical densities of over 2.0 are obtained by suitable moderation of the thermal energy of the vapor atoms such that the atoms form an amorphous image film which exhibits low specular reflectance. Moderation is achieved by use of low temperature and/or large area vapor sources, chemical interactions with the source or energy exchange between the vapor atoms and secondary gases or wall surfaces within the developing chamber.

3,732,013

MULTIPATH LASER MOVING TARGET INDICATOR

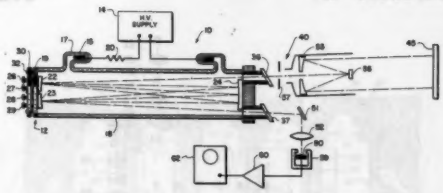
Hans Hieslmair, Elberon; John N. Fulton, West Long Branch, and Charles J. Bickart, Ocean, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed April 2, 1971, Ser. No. 130,740

Int. Cl. G01p *3/36*; H01s *3/00*

U.S. Cl. 356—28 **5 Claims**

A moving target velocity indicator including a multipath laser which operates simultaneously as an oscillator for producing a laser beam which is directed onto both a moving target and a detector and as an amplifier of the Doppler-shifted laser beam reflected from the target. The optical return signal from the target is amplified while passing through the multipath laser system and is directed, after the final pass



through the laser medium, onto the detector, This amplified signal can be combined at the detector with the transmitted signal to provide a beat signal at the frequency of the Doppler shift which can be applied to an oscilloscope display calibrated in frequency. Knowing the frequency of operation of the laser, the velocity of the target can then be calculated.

3,732,014

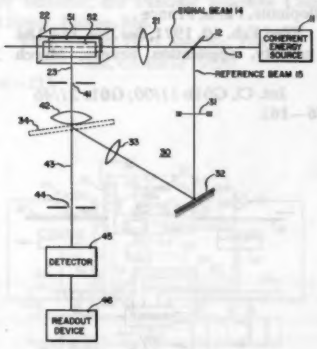
ELECTROMAGNETIC RADIATION APPARATUS FOR ANALYZING SMALL PARTICLES

Egidijus Edward Uzgiris, Schenectady, N.Y., assignor to General Electric Company

Filed Jan. 31, 1972, Ser. No. 222,150

Int. Cl. G01n *15/02, 21/00, 21/26*

U.S. Cl. 356—102 **15 Claims**

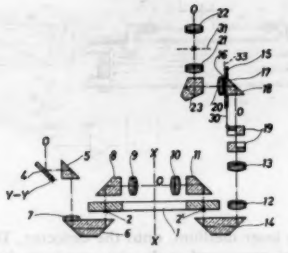


Method and apparatus for measuring static and dynamic properties of small particles are disclosed. A beam of energy is split into signal and reference beams. The signal beam is focused into a sample cell containing a solution or suspension of the particles to be analyzed, where it is scattered by interaction with the particles. Energy scattered at some angle is passed through restrictive apertures and a collecting lens to a detector. The reference beam is directed through an attenuator and a focusing lens to a fixed scattering matrix, which is located along the path of propagation of the scattered signal light. A portion of the scattered reference light is passed through a restrictive aperture to the detector where it is heterodyned with the scattered signal light.

3,732,015
ANGLE-MEASURING DEVICE

Wieland Feist, and Busso Von Chamier, both of Jena, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, District of Gera, Germany

Filed Nov. 19, 1970, Ser. No. 97,424
Int. Cl. G01c 1/06
U.S. Cl. 356—139 **2 Claims**

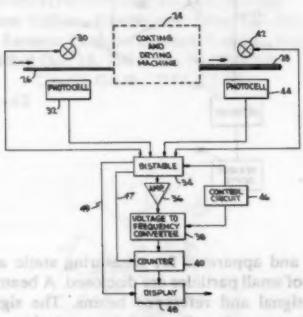


In an angle-measuring instrument having a reading microscope, the digital readings on the dial are displayed by apertures in a diaphragm which is located in the field of vision of the reading microscope. These apertures are: one for the division lines; one for the degree numbers; two for the even and odd numbers, respectively; and one for both the 1-minute numbers and the second numbers. The two 10-minute apertures are staggered relative to one another in such a manner that either an even number or an odd number is displayed at one time.

3,732,016
METHOD AND APPARATUS FOR MEASURING MATERIAL THICKNESS

Philippe-Marie Deshayes, Neuville des Dieppe, and Guy Paul Weber, Arques La Bataille, both of France, assignors to La Cellophane, Paris, France

Filed Feb. 10, 1971, Ser. No. 114,184
Claims priority, application France, March 25, 1970, 7010636
Int. Cl. G01b 11/00; G01r 21/46
U.S. Cl. 356—161 **8 Claims**

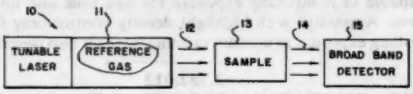


Apparatus for measuring material thickness including a source of light directed toward the material, a light detector receiving light from the source passing by the material and providing an output voltage dependent upon the light received, a voltage to frequency converter providing an oscillating output dependent upon the output voltage from the light detector, and a counter receiving the oscillating output from the converter to represent the thickness of the material by the count stored therein. A method for measuring material thickness including detecting light passed through the material and providing a voltage corresponding thereto, converting the voltage into a frequency signal dependent thereon, and counting oscillations of the frequency signals.

3,732,017
GAS ANALYZER UTILIZING A TUNABLE LASER WITH A REFERENCE SUBSTANCE IN THE LASER CAVITY

William G. Wolber, Southfield, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 23, 1970, Ser. No. 83,391
Int. Cl. G01n 21/06, 21/34
U.S. Cl. 356—201 **11 Claims**



A gas analyzer which employs a tunable laser is described. The laser is tunable over a well defined bandwidth so that coherent energy of all frequencies within the bandwidth is available. A known gas is introduced into the laser cavity so that the laser will lase only at the frequencies which correspond to the absorption frequencies of the gas. The output of the swept laser is therefore a reference spectrum containing a series of lines which correspond to the absorption frequencies of the known gas. The reference spectrum is therefore uniquely characteristic of the known gas. By illuminating a sample of an unknown gas with the reference spectrum some of, or all of, the peaks will be absorbed when the unknown gas partially, or completely, is composed of gases identical to those of the reference gas. The illumination from the unknown gas is detected with a broad band detector and the composition of the unknown gas identified by noting which of the reference spectrum peaks are absorbed and by the amount they are absorbed.

3,732,018
LETTERING PEN SUPPORT BRACKET FOR BOW PEN SHANK

George W. Streander, Alamogordo, N. Mex., assignor to Design Systems, Inc.

Filed Sept. 10, 1971, Ser. No. 179,482
Int. Cl. B43k 23/00
U.S. Cl. 401—48 **4 Claims**

An elongated extension member for use in conjunction with and as an axial extension of a lettering pen handle, the base end of a compass arm and other drafting implements. The extension member includes an elongated body portion having similarly laterally offset opposite ends provided with aligned bores. One of the aligned bores is adapted to receive one end

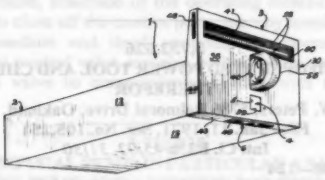
of a cylindrical connecting member and the other is adapted to receive a Leroy lettering pen for any one of a variety of cartridge ball-point pens as well as capillary type ink pen cartridges. The end of the cylindrical connecting member received in the first mentioned bore will be of a predetermined diameter and the other end of the cylindrical member may be of any one of a plurality of predetermined diameters such as 3, 3.5 or 4 millimeters, these diameters being compatible with a substantial majority of the end bore diameters of various types of drafting implements with which the support bracket may be used.

3,732,019

CARD TRAY CONSTRUCTION AND METHOD OF FORMING SAME

Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed March 18, 1971, Ser. No. 125,493
Int. Cl. B42f *13/00, 17/16*
U.S. Cl. 402—61 **2 Claims**



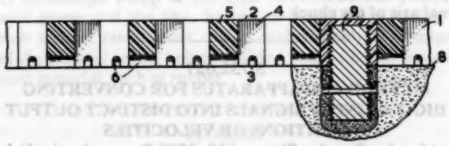
A card tray construction including a tray body section; a tray front section affixed to a front wall of the body section; a card holder rod running through the front section and into the tray body section for the purpose of stringing cards to be retained in the tray section; and a holder rod latching device accessible through an opening in the bottom wall of the front section. The latching device is in the form of a prefabricated unit, which is adapted to be inserted through its access opening and be automatically retained in a proper mounted position upon assembly of the front and tray body section.

3,732,020

PREFORMED SURFACING FOR PAVEMENTS

Raymond Frank Aspinale Judge, London; Frederick Royal Martin, Bournemouth, and Russell George Mozley, Carshalton, all of England, assignors to The Secretary of State for the Environment in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland

Filed Feb. 4, 1971, Ser. No. 112,668
Claims priority, application Great Britain, Feb. 4, 1970, 5,358/70
Int. Cl. E01c *11/24*
U.S. Cl. 404—19 **13 Claims**



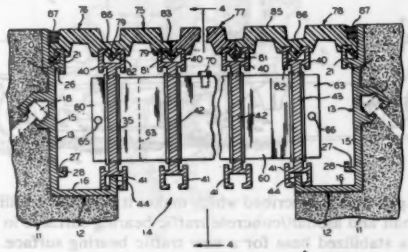
A preformed surfacing for a pavement is in the form of a sheet of flexible material containing cavities open to its upper surface and interconnected by ducts beneath the surface so that when laid down on a prepared subsurface having a drainage slope, water falling on the surfacing can drain away through the cavities and ducts. The sheet can be fixed to the subsurface by anchors bonded into cavities in the sheet.

3,732,021

MODULAR EXPANSION JOINT

Michael C. Rizza, Walnut Creek, Calif., and Delmont D. Brown, North Baltimore, Ohio, assignors to The D.S. Brown Company, North Baltimore, Ohio

Filed March 8, 1971, Ser. No. 121,957
Int. Cl. E01c *11/10*
U.S. Cl. 404—57 **9 Claims**



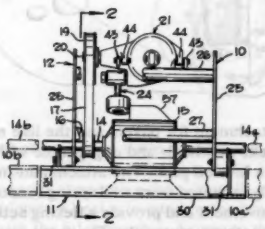
Modular expansion joint made from aluminum extrusions providing the longitudinal frames, longitudinal rails, and load-bearing support beams. The rails have an I-beam structure with downwardly and upwardly opening channels respectively receiving a lip of the frames and receiving and interlocking therein deformable longitudinal beads on the lower surface of an elastomer tread which completely covers and spans the joint. The load-bearing, length-variable beams extend through the rails, and coil springs are interposed between contiguous rails. The rails are composed of aligned rail segments with contiguous ends slidably spliced together.

3,732,022

VIBRATORY COMPACTOR

John Henry Danuser, c/o Danuser Machine Company, 500 East 3rd Street, Fulton, Mo.

Filed Nov. 8, 1971, Ser. No. 196,637
Int. Cl. E01c *19/30*
U.S. Cl. 404—113 **10 Claims**



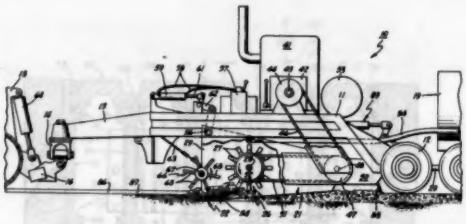
This compactor includes a compacting shoe carrying a fixed housing mounting a vibration inducing shaft. The shoe is resiliently mounted to a carrier frame and a gearbox pivotally mounted to the carrier frame transmits power to the vibration shaft by means of a flexible belt assembly. The flexible belt is tensioned by means of an adjustable arm, which extends between the gearbox housing and the vibration shaft housing and is disposed on the center line between driver and driven elements of the flexible drive assembly. The arm is pivotally connected at one end to the gearbox housing and resiliently connected at the other end to the vibration shaft housing.

3,732,023

SOIL STABILIZATION APPARATUS

Carleton L. Rank, Walnut Creek, and Ray T. Ryan, San Rafael, both of Calif., assignors to Metradon Associates, Lafayette, Calif.

Filed March 11, 1969, Ser. No. 806,121
Int. Cl. E01c *19/02*
U.S. Cl. 404—90 **4 Claims**



Apparatus is described which makes it possible to utilize old asphalt and asphalt/concrete traffic bearing surfaces in forming a stabilized base for a new traffic bearing surface. Basically, the apparatus of the invention comprises a vehicle having a transversely extending cutting blade mounted in a location to sever an upper layer of the material over which it is traveling from the remainder of the material and feed such layer rearwardly relative to the traveling vehicle to a pulverizing and mixing rotor also extending transversely of the apparatus.

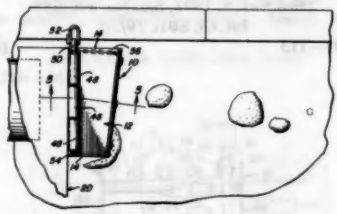
Besides pulverizing an old traffic bearing surface, the rotor mixes same with soil and a soil stabilizing medium such as lime or cement. The degree of pulverization and mixing, as well as the thickness of the surface layer removed, is controllable.

3,732,024

LEVELER FOR PAVING MACHINE

James A. Gendrich, R.R. No. 2, Box 245, Burlington, Wis.

Filed March 1, 1971, Ser. No. 119,690
Int. Cl. E01c *19/22*
U.S. Cl. 404—118 **8 Claims**



A leveling attachment for pavers and the like mounted forward of the tracks or wheels and engageable with the ground so as to define a leveled path. The attachment includes a depending pivotally mounted front wall spring-loaded so as to resist rearward movement and provide a flexing action to loosen and move encountered materials. The front wall is laterally inclined so as to inwardly direct the material and is vertically adjustable.

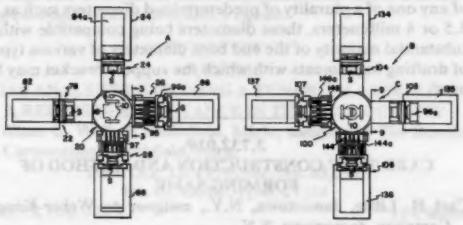
3,732,025

METHOD FOR MACHINING VALVE BODY CASTINGS

Harry E. Miles, Jr., and Dale W. Wright, both of Saginaw, Mich., assignors to Miles Machinery Company, Saginaw, Mich.

Filed June 15, 1971, Ser. No. 153,205
Int. Cl. B23b *35/00, 41/00*
U.S. Cl. 408—1 **13 Claims**

The method of, and system for, machining valve body castings, and the like, having inlet and outlet cored openings in opposite ends thereof, a valve seat, and a cored bonnet opening in the side thereof comprising the steps of: positively locating the casting via the opposed cored openings by inserting locating plugs in the inlet and outlet openings; machining



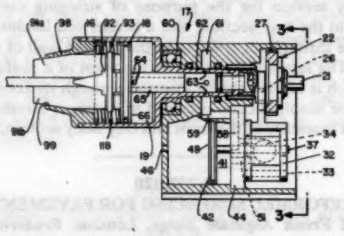
the bonnet opening and/or seat of the positively located valve body; repositioning the valve body and positively locating on the machined bonnet opening and/or seat; and then machining the cored inlet and outlet openings or flange openings in opposite ends thereof.

3,732,026

HAND OPERATED POWER TOOL AND CHUCK THEREFOR

Rudolph W. Peters, 5786 Balmoral Drive, Oakland, Calif.

Filed Jan. 11, 1971, Ser. No. 105,251
Int. Cl. B23b *45/02, 31/30*
U.S. Cl. 408—124 **13 Claims**



A hand power tool is described having a drive arrangement providing on initial energization of the unit automatic gripping of a tool. The drive arrangement includes a fluid pump which is driven by the motor of the tool when it is first started. The pump delivers fluid pressure to a chamber within the tool chuck and drives a piston therein which, in turn, drives the jaws of the chuck into clamping engagement with the tool piece shank. The jaws of the chuck are meshed with one another in a manner assuring that they uniformly move radially inward to grip the shank and align the tool with the rotational axis of the chuck.

3,732,027

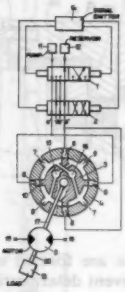
METHOD AND APPARATUS FOR CONVERTING DIGITAL INPUT SIGNALS INTO DISTINCT OUTPUT POSITIONS OR VELOCITIES

Kurt Lupke, Dresden Strasse 113, 3300 Braunschweig; Urban Ragg, Leibnizstr. 7, Waiblingen near Stutgart, and Gunter Diessel, Gottelmannstrasse 42b, Mainz, all of Germany

Filed June 18, 1970, Ser. No. 47,342
Int. Cl. F15b *11/12, 13/044*
U.S. Cl. 415—51 **5 Claims**

Method and apparatus for converting digital input signals into output positions or velocities employing a flowing medium. A directional control valve receives an input signal and

transmits the signal in the form of a flowing medium to a servo valve having a plurality of control ports and a slide with a plurality of closure members to shut off certain of the control ports. Flowing medium proceeds through the valve to actuate a motor means having an operating member. The operating member is directly connected to the slide member of the valve



and, therefore, actuation of the operating member operates the slide to close off the control ports, thereby terminating the flowing medium and thusly stopping the operation. The directional control valve can also be hooked in parallel with the servo valve to communicate directly with the motor means.

3,732,028

CENTRIFUGAL PUMP, IN PARTICULAR A SAND OR GRAVEL PUMP, AND A METHOD FOR OPERATING SUCH A PUMP

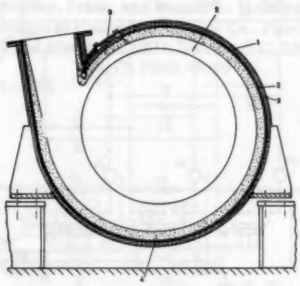
Peter A. Heynemanns, Arnhem, and Franciscus Noordhoff, Bergen, both of Netherlands, assignors to N.V. Rubberfabriek Vredestein, The Hague, Netherlands

Filed June 16, 1971, Ser. No. 153,551

Claims priority, application Netherlands, July 1, 1970, 7009709

Int. Cl. F04b *7/00*

U.S. Cl. 415—197 **5 Claims**



A centrifugal pump of the type such as a sand pump, a gravel pump and the like, having an outer pump casing in which a sheet metal inner casing exchangeably is arranged, said sheet metal casing being provided with a liner of wear-resistant material, such as rubber.

3,732,029

COMPACT HEAT EXCHANGER

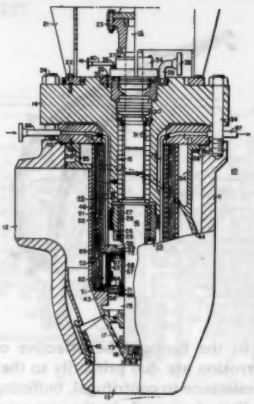
James R. Raymond, Leechburg, and Clarence I. Thomson, III, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1971, Ser. No. 207,924

Int. Cl. F01d *11/00, 5/08*

U.S. Cl. 415—111 **10 Claims**

The heat transfer efficiency of a heat exchanger is increased by making the entire flow pattern of the exchanger a straight-through flow pattern, thereby providing a compact heat exchanger which is substantially 100 percent effective and



compact in size. Thus, the required cooling effect is accomplished with an exchanger which is smaller in size than a prior exchanger and has a reduced cost.

3,732,030

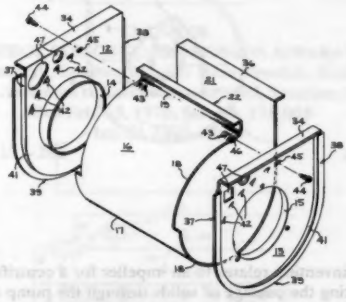
BLOWER WHEEL ASSEMBLY

Donald M. Mullings, Yardley, Pa., assignor to General Electric Company, Louisville, Ky.

Filed March 2, 1972, Ser. No. 231,223

Int. Cl. F04d *29/42, 29/40*

U.S. Cl. 415—219 **4 Claims**



By the present invention there is provided a blower wheel housing having generally parallel side walls including an air inlet and a wrapper connecting the side walls to form a hollow chamber. A blower wheel is located in the housing and is axially aligned with the inlet opening. Access to the blower wheel for its removal or servicing is provided by peeling back the wrapper radially away from the blower wheel.

3,732,031

COOLED AIRFOIL

Charles E. Bowling, Speedway; George B. Meginnis, and Ronald P. Schwedland, both of Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

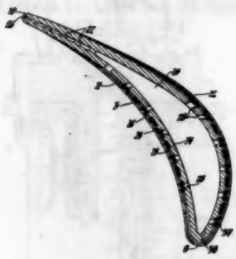
Filed June 17, 1970, Ser. No. 47,046

Int. Cl. F01d *5/18*

U.S. Cl. 416—97 **3 Claims**

A cooled turbine blade or vane for high-temperature machines. To obtain maximum strength and oxidation re-

sistance and the best cooling characteristics, the airfoil has a core of cast super alloy covered by a porous facing of wrought super alloy sheet, the core providing passages to transmit the



cooling fluid to the facing. The effective cooling and resistance to corrosion are due primarily to the facing and the strength and resistance to centrifugal, buffeting, or ballooning loads are contributed primarily by the cast core.

3,732,032

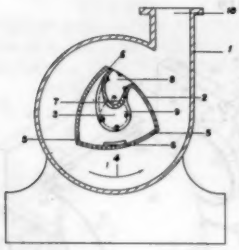
CENTRIFUGAL PUMPS

Charl M. Daneel, Wellington, Republic of South Africa, assignor to Baggers (Proprietary) Limited, Bellville, Cape Province, Republic of South Africa

Filed Feb. 16, 1971, Ser. No. 115,333

Int. Cl. F01d *5/00*

U.S. Cl. 416—144 **6 Claims**



The invention relates to an impeller for a centrifugal pump permitting the passage of solids through the pump and which maintains a high delivery pressure and capacity in which the impeller has a body having, in cross section, a regular polygonal configuration, an axis of rotation located substantially equidistant the corners of the body, an inlet to the body located at the axis of rotation, an outlet from the body provided in a sidewall of the body and a conduit communicating between the inlet and the outlet.

3,732,033

BOAT PROPELLER LOCK

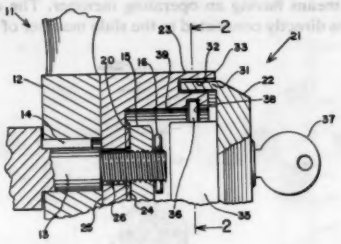
Joseph E. Macchi, 6 Richard Avenue, Bellingham, Mass.

Filed Jan. 3, 1972, Ser. No. 215,008

Int. Cl. B63h *1/20*

U.S. Cl. 416—244 **11 Claims**

Disclosed is an enclosure which can be locked in position to conceal a nut used to secure a boat propeller to a drive shaft. The enclosure includes a cover portion that can be locked into engagement with a base portion that is retained by and specially accommodates the nut. Both the enclosure and the lock



mechanism therefore are formed of an oxidation resistant material so as to prevent deterioration during use in a water environment.

3,732,034

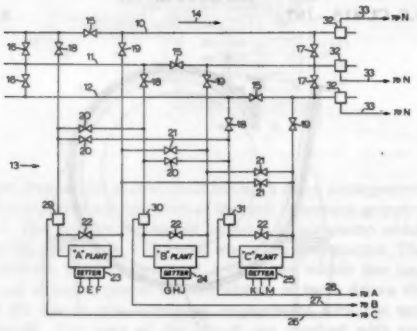
CONTROL SYSTEM FOR COMPRESSORS OPERATING IN PARALLEL

Robert J. C. Reid, Oakville, and Graham F. Crate, Ottawa, Ontario, both of Canada, assignors to Trans-Canada Pipe Lines Limited, Toronto, Ontario, Canada

Filed July 21, 1971, Ser. No. 164,572

Int. Cl. F04b *41/06*

U.S. Cl. 417—6 **9 Claims**



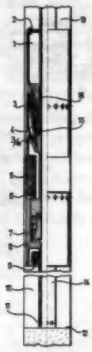
Control apparatus for controlling the operation of a compressor station comprising at least two compressor plants connected to operate in parallel, includes means providing "raise" and "lower" signals responsive to the discharge pressure of the station being lower or higher respectively than a desired discharge pressure, control means providing for each compressor plant a control signal that is responsive to the differences between the actual and desired flows of the compressor plant, control means for each compressor plant that control the plant to raise or lower the discharge pressure of the station, means that supply the "raise" or "lower" signals to the control means, and means responsive to the control signals for gating the supplying means on and off to permit or block delivery of "raise" and "lower" signals to the control means.

3,732,035

DEVICE FOR INTERMITTENT GAS-LIFT EXPLOITATION OF OIL WELLS

A. Pal Szilas; Janos Bognar; Bela Mating, and Laszlo Bajoczky, all of Miskolc, Hungary, assignors to Nagyalfoldi Koolaj-es Foldgaztermelo Vallalat, Szolnok, Hungary

Filed April 29, 1971, Ser. No. 138,543
Int. Cl. F04f *1/06, 3/00*; F16k *15/00*
U.S. Cl. 417—143 **4 Claims**



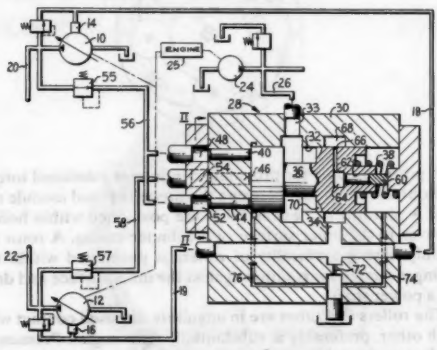
A device for the intermittent exploitation of gas-lift oil wells lines with a casing seals the lower portion of the casing from the upper portion except through a valved passageway. The valve is a flexible diaphragm communicating with an oleo-pneumatic chamber through capillary orifices so that when gas under pressure is supplied from the surface, the flow of liquid through the capillary orifices delays the opening of the valve.

3,732,036

SUMMING VALVE ARRANGEMENT

William F. Busbey, Pekin, and Donald L. Hopkins, Joliet, both of Ill., assignors to Caterpiller Tractor Co., Peoria, Ill.

Filed March 24, 1971, Ser. No. 127,738
Int. Cl. F04b *49/00*
U.S. Cl. 417—216 **7 Claims**



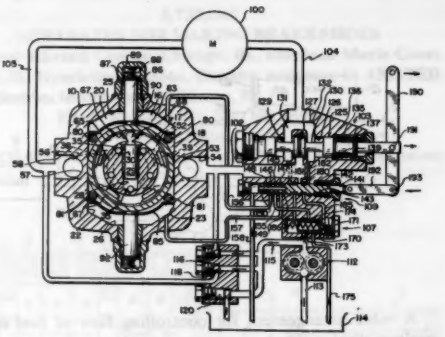
There is disclosed control means that is operative to vary the horsepower output of a plurality of variable displacement pumps in response to the sum of the outputs of the pumps.

3,732,037

PUMP DISPLACEMENT CONTROL

Floyd E. Carlson, 4504 Lanewood Circle, Rockford, Ill.

Filed May 27, 1971, Ser. No. 147,442
Int. Cl. F04b *49/00*; F15b *15/18*
U.S. Cl. 417—217 **15 Claims**



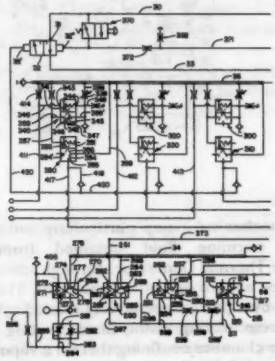
A control for a variable displacement pump adapted to supply a reversible load device including fluid operable means for varying the displacement of the pump in opposite directions from neutral to supply fluid in opposite directions to the load, means providing a source of control fluid under pressure, a directional valve for directing control fluid to opposite sides of the displacement varying means to determine the direction of pump delivery, a variable orifice for creating a measurable pressure drop in the pump inlet or the pump outlet, means for sensing the pressure drop across the orifice to control the amount of displacement to provide constant flow, and a single control for first operating the directional valve to establish the direction of pump delivery and then varying the orifice to establish the amount of flow.

3,732,038

CONTROL FOR GAS COMPRESSION APPARATUS

Karol Pilarczyk, Loudonville, and Hans Pennink, Scotia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 23, 1971, Ser. No. 118,005
Int. Cl. F04b *49/02*
U.S. Cl. 417—282 **2 Claims**

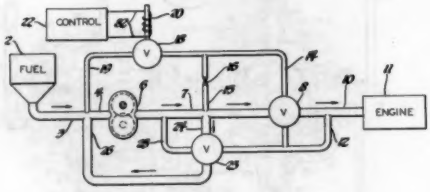


A control for discontinuing normal operation of gas compression apparatus in which a plurality of interconnected devices operate to place the apparatus in an idle state upon the occurrence of an undesirable condition in the apparatus.

3,732,039
FUEL CONTROL VALVE

Frank S. Carothers, Jr., Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1971, Ser. No. 201,741
Int. Cl. F04b 49/00; G05d 11/00
U.S. Cl. 417—300 4 Claims

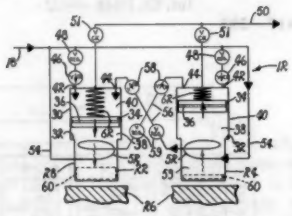


A valve arrangement for controlling flow of fuel from a positive-displacement pump to an engine such as a gas turbine, the control being exerted by an electric current which biases a pilot valve to regulate a control pressure. The control pressure and pressure of metered fuel act in opposition on a metering valve so that the pressure of fuel delivered to the engine is determined by the control pressure and thus by the electric current. Metered fuel pressure and pump outlet pressure control a by-pass valve which returns excess fuel to the pump inlet. The entire control arrangement preferably is integrated into a compact assembly.

3,732,040
PUMP FOR DELIVERING HEATED FLUIDS

George M. Low, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Eric E. Sabelman, Sierra Madre, Calif.

Filed March 2, 1971, Ser. No. 120,241
Int. Cl. F04b 17/00; F03g 7/06
U.S. Cl. 417—391 5 Claims

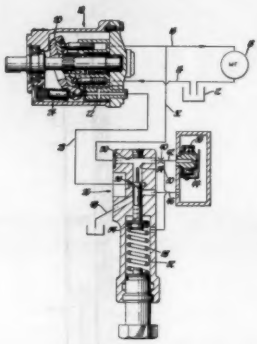


A thermomechanical pump particularly suited for use in pumping a warming fluid obtained from an RTG (Radioisotope Thermal Generator) through science and flight instrumentation aboard operative spacecraft. The invention is characterized by a pair of operatively related cylinders, each including a reciprocating piston head dividing the cylinder into a pressure chamber confining therein a vaporizable fluid, and a pumping chamber for propelling the warming fluid, and a fluid delivery circuit for alternately delivering the warming fluid from the RTG through the pressure chamber of one cylinder to the pumping chamber of the other cylinder, whereby the vaporizable fluid within the pair of pressure chambers alternately is vaporized and condensed for driving the associated pistons in pumping and intake strokes.

3,732,041
POWER TRANSMISSION

Thomas E. Beal, Rochester, and John W. Curnow, Utica, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed June 10, 1971, Ser. No. 151,680
Int. Cl. F04b 1/26
U.S. Cl. 417—222 2 Claims

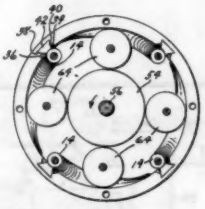


A pump for use in a hydraulic power transmission system has a servomotor for varying its displacement which is controlled by a valve responsive to delivery line pressure of the pump. The valve, in turn, is controlled both by a spring which determines a minimum level of delivery pressure and by a piston responsive to the pressure level in a bleed circuit. The bleed circuit includes a fixed restriction and an electrically modulated flapper valve so that the pressure level in the pump delivery line may be modulated by adjustment of the current flowing through the coil of the electrically modulated flapper valve.

3,732,042
POWER MODULE

William Buchholz, Roscoe, N.Y.

Filed June 3, 1971, Ser. No. 149,626
Int. Cl. F04b 43/08
U.S. Cl. 417—477 8 Claims



A power module for providing continuous rotational torque without direct contact between the propellant and module rollers. A plurality of flexible tubes are positioned within helical grooves in the inner surface of a cylinder casing. A rotor assembly having a plurality of rollers is positioned within the casing mounted for rotation against the inner surface and driving a power shaft.

The rollers and tubes are in angularly disposed contact with each other, preferably at substantially right angles. Pressure is applied to the tubes causing them to uniformly expand along the grooves and inwardly of the inner surface of the cylinder, driving the rollers. The chordal distance between the rollers and the location of the tubes along the inner surface of the cylinder is crucial and designed so that as the roller is forced off the edge of one tube, at the exit end, the succeeding roller

is just about ready to make contact with the entrance end of the particular tube. As the first roller leaves the tube, the force causing a pressure build-up behind the roller is removed and fluid can be expunged therefrom. There is sufficient inertia in the succeeding roller to cause it to move onto the entrance end of the tube and the continuing fluid entering the tube immediately causes a pressure build-up behind the roller and the process begins again.

When the tubes have been completely expanded, the inertia within the rollers carries them until they are positioned just ahead of the next collapsed tube, and the procedure is repeated.

3,732,043

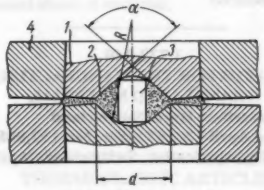
HIGH-PRESSURE AND HIGH-TEMPERATURE DEVICE

Valentin Nikolaevich Bakul, ulitsa Kirova, 34a, kv. 12; Alexei Iosifovich Prikhna, ulitsa Vyshgorodskaya, 33, kv. 20, and Alexandr Alexandrovich Shulzhenko, ulitsa Novo-Konstantinovskaya, 17, kv. 27, all of Kiev, U.S.S.R.

Filed April 22, 1971, Ser. No. 136,527

Int. Cl. B30b *11/32*

U.S. Cl. 425—77 **6 Claims**



A high pressure/temperature device for carrying out the synthesis of superhard materials, such as diamond and cubic boron nitride, the device consisting of two dies having recesses in closing faces, said recesses forming, in combination, a high-pressure chamber which accommodates a container charged with a reaction mixture. In each die, the recess is made in the form of a truncated cone conjugated with a sphere or in the form of a hyperboloid of revolution.

3,732,044

PRODUCTION LINE FOR PRODUCTS OF PRESTRESSED CONCRETE OR OF REINFORCED CONCRETE

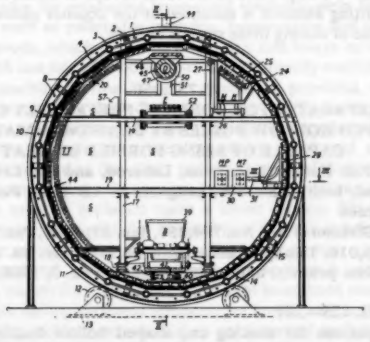
Mircea Borcoman, 53,55 Bd de la Villette, Paris, France

Filed Oct. 7, 1970, Ser. No. 79,187

Claims priority, application France, Oct. 10, 1969, 6934660

Int. Cl. B28b *5/12, 23/06*

U.S. Cl. 425—111 **7 Claims**



The production line includes a rotary hall, which itself transports the moulds, in front of installations for cleaning and oiling, positioning and stressing, concreting, heat treatment, demoulding and removal, and a metallic structure, which passes through the hall thereby supporting all the installations in the best working positions and various enclosures. The rotation of the hall is effected stepwise or in continuous movement, on rollers, mounted on the outside.

3,732,045

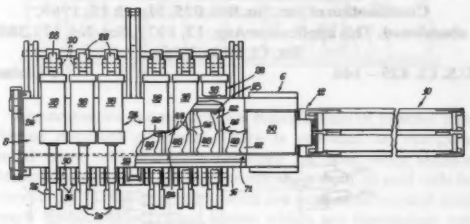
APPARATUS FOR MAKING BRAKE SHOES

Howard Edward George, Chicago, Ill., and Jean Marie Guertin, St. Hyacinthe, Quebec, Canada, assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Oct. 14, 1971, Ser. No. 189,362

Int. Cl. B30b *11/06*

U.S. Cl. 425—117 **4 Claims**



A heated brake shoe press has a longitudinal open end cavity defined by a base and cover. One end of the cavity may be closed by a movable platen. A movable plunger projects into the other end of the cavity and is slideably engaged with the cavity throughout its length. Inserts and liners are slideably engaged in the cavity in a given order and define a plurality of molding cavities that are fillable with moldable material. The heat, and the pressure exerted by the plunger configures the material in the molding cavities to a shape defined by the inserts and liners. After forming, the platen may be moved to an open position and the inserts and configured material may be pushed out of the cavity by the plunger. To accommodate such action and to reduce galling and scoring of the cavity walls, Teflon buttons are attached to the insert faces which engage the cavity wall.

3,732,046

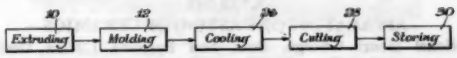
DIMENSIONAL CONTROL APPARATUS

Ronald C. Martin, Newark, Del., and Marty E. Sixt, Napolean, Ohio, assignors to Advanced Drainage Systems, Inc., Columbus, Ohio

Continuation of Ser. No. 804,963, March 6, 1969, abandoned. This application March 22, 1971, Ser. No. 127,052

Int. Cl. B29c *3/06, 17/02, 17/16*

U.S. Cl. 425—140 **6 Claims**



Apparatus and method control dimensions of corrugated tubing by stretching tubing predetermined amount as it travels between molding unit and downstream pulling assembly running at about same rate tubing is discharged from molding unit. First counter mechanism adjacent discharge end of molding unit counts predetermined number of corrugations in tubing and immediately thereafter generates signal indicating that predetermined number has been counted. Generation of signal from first counter triggers signal from second counter mechanism indicative of number of corrugations passing

pulling assembly. Signal from second counter indicates more than predetermined number of corrugations has been counted, less than predetermined number has been counted, or count substantially equal to predetermined number. When more than predetermined number of corrugations is counted speed of pulling assembly is incrementally decreased to lessen stretch of tubing, and conversely, when less than predetermined number is counted speed of pulling assembly is incrementally increased to increase stretch of tubing. Second counter mechanism is initially adjusted so that no signal is generated by second counter when tubing between molding unit and pulling assembly is stretched predetermined amount.

3,732,047

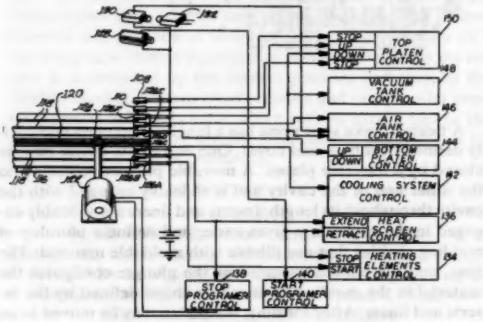
THERMOFORMING APPARATUS

Robert E. Kostur, Oak Brook, Ill., assignor to Comet Industries Inc., Bensenville, Ill.

Continuation of Ser. No. 808,075, March 18, 1969, abandoned. This application Aug. 12, 1971, Ser. No. 171,385

Int. Cl. B29c *3/06*

U.S. Cl. 425—144 **9 Claims**



A plastic program card includes a plurality of projecting rows of plastic each having notches at selected locations. It is driven through a program unit having a different push-button switch aligned with each row of the card to be actuated by the notches therein to control different functions of the thermoforming machine. The temperature of the sheet of plastic, the positions of the moving parts of the thermoforming machine, and the position of the plastic being formed are sensed by other devices within the thermoforming machine and these devices control further operations of the machine and control the driving of the plastic program card through the program unit.

3,732,048

APPARATUS FOR CASTING OF CERAMICS

Michel Henri Guerga, Bois, and Bernard Lucien Desire Hallier, La Varenne, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

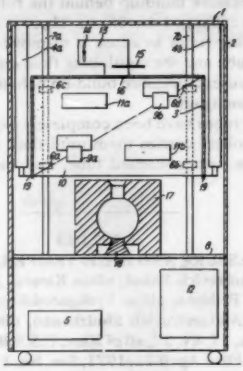
Filed Feb. 8, 1971, Ser. No. 113,483

Claims priority, application France, Dec. 18, 1970, 7005727

Int. Cl. H05b *9/00*; B28b *1/26*

U.S. Cl. 425—174.4 **4 Claims**

Ceramic articles are cast in plaster molds using a combination of microwave heating and air ventilation. A mold is filled with a slurry and positioned in a cavity having sources of microwave energy to heat the material to a desired temperature. A ventilation device then supplies cool pulsed air to the external surface of the mold to set the slurry. Excess slurry is emptied, further microwave heating applied and cooler air directed into the interior of the mold to harden the paste. The



molds are then removed and dried with hot air for reuse. Homogeneous drying minimizes cracking and the processing time is greatly reduced.

3,732,049

APPARATUS FOR THE MANUFACTURE OF GRANULATED MATERIAL

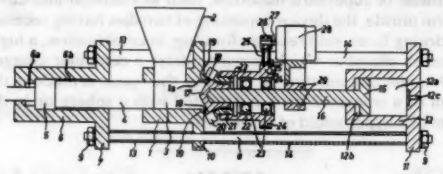
Hans Studli, Winterthur-Hard, Switzerland

Filed April 12, 1971, Ser. No. 132,988

Claims priority, application Switzerland, April 22, 1970, 6036/70

Int. Cl. B29f *3/14*

U.S. Cl. 425—192 **6 Claims**



An apparatus for manufacturing granulated material wherein a press or compression cylinder for a plastic molding material possesses a discharge end which can be closed by a counter piston. Between the peripheral edge of the compression cylinder and the peripheral edge of the counter piston there is provided a substantially ring-shaped throughpassage. Groove means are formed at least at one of the peripheral edges and through which groove means the molding material or mass can be pressed in the form of rods or strands. A rotating cutting element is mounted at the counter piston for the purpose of cutting these strands or rods.

3,732,050

APPARATUS FOR FORMING PREFERABLY CUP-SHAPED HOLLOW BODIES BY DRAWING A MATERIAL CAPABLE OF BEING FORMED BY HEAT

Sven Nils Hakan Holmstrom, Loberod, and Jan-Erik Olsen, Lund, both of Sweden, assignors to AB Tetra Pak, Lund, Sweden

Division of Ser. No. 794,257, Jan. 27, 1969, Pat. No. 3,608,016. This application April 28, 1971, Ser. No. 138,303

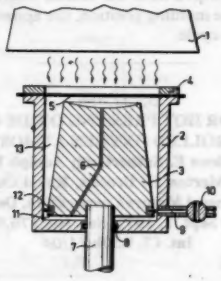
Claims priority, application Sweden, Feb. 7, 1968, 1611/68

Int. Cl. B29c *17/02*

U.S. Cl. 425—289 **2 Claims**

Apparatus for making cup-shaped hollow bodies having means for clamping a sheet of thermoplastic material over a closed space having a mandrel therein, means for heating said

sheet and then moving the mandrel out from the closed space and against the heated sheet to deform same and form a hollow body. Means are provided for making the walls of the body substantially uniform and for severing the hollow body from the unused sheet of material.



3,732,051

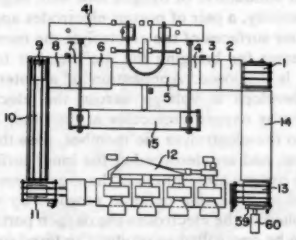
MOLDING APPARATUS FOR PRODUCING RESINOUS THERMOPLASTIC ARTICLES

Masaya Sakabe; Elichi Kobinata, and Masaru Takaoka, all of Inashiki-gun, Japan, assignors to Mitsubishi Petrochemical Company, Limited, Tokyo-to, Japan

Filed Aug. 27, 1970, Ser. No. 67,510

Int. Cl. B29c *24/00*

U.S. Cl. 425—407 **6 Claims**



Apparatus for producing large-sized synthetic resin foamed articles, such as pallets for carrying, transporting and storing freight goods, which are relatively bulky and heavy in weight and which can not be produced with an oridnarily available injection machine having limited capacity, is provided, which comprises metallic including an upper and lower section, means for transporting said molds in an endless path including means for changing the direction of travel of said molds, means for removing the upper section from the lower section and for transporting said upper section to a point downstream where it may be replaced upon a lower section filled with plastic material, means for remaining a formed article from the lower section, means for filling the lower section with raw plastic material after which the upper section is replaced thereon, means for heating the mold in at least three consecutive stages having different temperature levels, and means for cooling the molds from which they are returned to the upper section removal means. The aforementioned means are consecutively arranged along the endless mold transporting path in the order hereinbefore set forth.

3,732,052

APPARATUS FOR THE CONTINUOUS MANUFACTURE OF PRECAST REINFORCED CONCRETE PRODUCTS, PARTICULARLY SLABS AND BEAMS

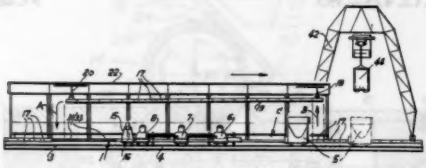
Klaus Gunia, Neuwied, Germany, assignor to Friedr. Remy Nachfolger GmbH, Neuwied/Rhein, Germany

Filed Feb. 22, 1971, Ser. No. 117,545

Claims priority, application Germany, Feb. 24, 1970, P 20 08 457.5

Int. Cl. B28b *7/14*

U.S. Cl. 425—219 **15 Claims**



Apparatus for the continuous manufacture of precast reinforced concrete products. There is provided an elongated mold track with the rails arranged on both sides thereof. Means for distributing concrete are supported on said rails for movement therealong. Said molds are supported on said mold track by suitable carriage means which are themselves supported on said rails. Vibratory compacting and smoothing means may also be supported, interchangeably if desired, on said carriages. Stepwise movable separating means, which may include a vertically vibratory knife, are supported on said rails and arranged for suitably cutting the poured concrete into selected lengths. Heat insulative covering hoods are arranged over said molds and means are provided for lifting said hoods off from mold carrying carriages wherein the concrete material is partially dried and replacing same over freshly poured concrete products.

3,732,053

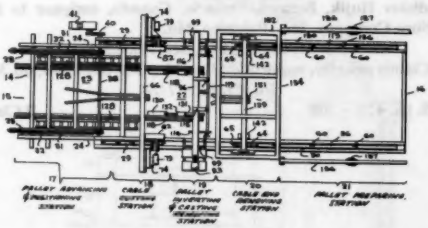
APPARATUS FOR REMOVING CURED CONCRETE ARTICLES FROM PALLETS

Ercell L. Glass, Tampa, Fla., assignor to J. L. Cone, Jr.; C. W. Cone and Douglas P. Cone

Division of Ser. No. 872,662, Oct. 30, 1969, Pat. No. 3,611,518, which is a division of Ser. No. 660,133, Aug. 11, 1967, abandoned. This application July 28, 1970, Ser. No. 58,759

Int. Cl. B28b *13/04, 23/06*

U.S. Cl. 425—289 **13 Claims**



Apparatus and method for removing cured concrete articles, particularly prestressed concrete articles, from pallets in which they are cast and cured which includes feeding and guiding pallets containing cured articles into predetermined position, cutting by saws the stressing cables to free castings from the pallets, inverting the pallets beneath plungers which enter openings in the pallet bases and press castings from the pallets onto receiving means which lower them to an accumulating area, reverting the pallets to their previous orientation, driving the cut cable ends from the pallet retaining means by

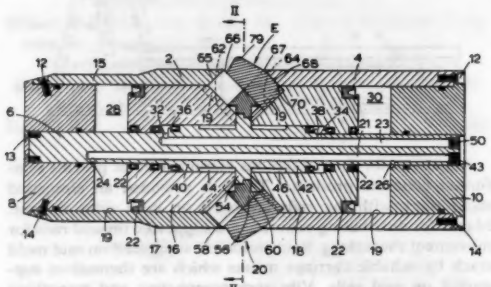
swinging hammers, and cleaning, oiling and restranding the empty pallets, the pallets being moved step-by-step from one operating procedure station to the next from entering into the apparatus to exit therefrom.

3,732,054

ANNULAR EXPANDING RING STRUCTURE

Bjorn Lyng, Vanvikan, Norway, assignor to Lyng Industrier A/s Lekswikarmatur, Leksvik, Norway

Filed Oct. 18, 1971, Ser. No. 189,958
Claims priority, application Norway, Oct. 22, 1970, 3996/70
Int. Cl. B29c *17/00*
U.S. Cl. 425—393 **9 Claims**



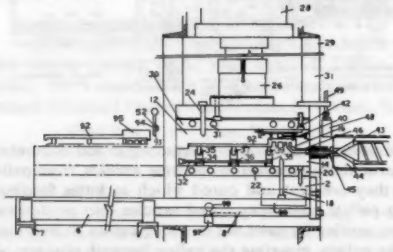
An annular expanding ring structure comprising a number of circumferentially arranged segments adapted to undergo partly radial movements relative to the central axis therethrough. The segments are arranged in two complementary sets such that each of the segments in the ring structure is interposed with surface contact between the two adjacent segments of the other set in alternating fashion. Each of the segments is suspended in a cylindrical body constituting the support for the segments to be moveable in synchronized fashion along a straight axis lying in the respective one of two identical cones, one for each set. The cones have common axis and geometrically coinciding base circles, which circle constitutes the center plane of the ring structure. Each of the segments has two opposed plane sliding faces, and the average angle between the opposed side faces of each segment viewed in a plane normal to the central axis is 360° : E, wherein E is the total number of segments.

3,732,055

APPARATUS FOR AUTOMATICALLY PRODUCING A MOLDED SOLE

Ladislav Hujik, Batawa, Ontario, Canada, assignor to Bata Shoe Company, Inc., Belcamp, Md.

Filed Oct. 30, 1970, Ser. No. 85,481
Claims priority, application Canada, Oct. 31, 1969, 66,367
Int. Cl. B29f *1/14*
U.S. Cl. 425—308 **2 Claims**



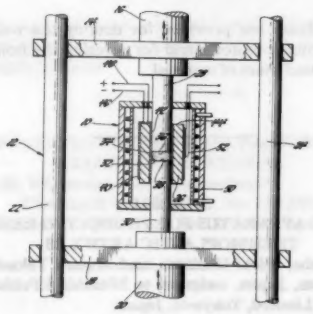
The automatic manufacture of a molded sole in which means are provided for automatically removing the sprues of material normally remaining attached to a sole after the molding thereof with the sprues being removed during movement of the molds between a molding position and a discharge position. Subsequently and during the return movement of the molds from the discharge position to the molding position, the molded soles are wiped from the molds, whereby upon return of the molds to the molding position, the apparatus is ready for a further molding cycle.

3,732,056

APPARATUS FOR HOT PRESSING OXIDE CERAMICS IN A CONTROLLED OXYGEN ATMOSPHERE

Davis D. Eddy; Glenn E. Sutherland; Adolph L. Micheli, all of Roseville, and Merton H. Brooks, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 1, 1971, Ser. No. 176,842
Int. Cl. B30b *11/04*
U.S. Cl. 425—352 **6 Claims**



An improved hot press apparatus for compacting oxide ceramic powders including an electrolyte die member of a solid material conductive of oxygen ions with negligible electronic conductivity, a pair of porous electrodes applied to the inner and outer surfaces of the electrolyte die member, and a resistance heater for bringing the die member to hot press temperature is disclosed. Application of a potential to the electrodes develops a voltage across the electrolyte die member whereby oxygen molecules at the outer surface are adsorbed into the electrolyte die member, pass therethrough as oxygen ions, and are desorbed at the inner surface thereof to provide an oxygen atmosphere in the area where pressure is being applied to the oxide ceramic powder. By varying the potential applied to the electrodes the oxygen partial pressure in the die can be controlled to produce sintered oxide ceramics having improved electrical, magnetic and mechanical properties.

3,732,057

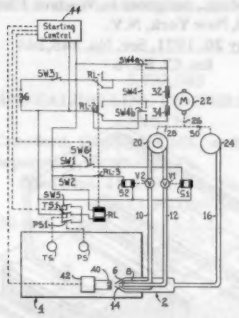
OIL BURNER SYSTEM

Kurt Lipper, and Uri Chaim Lipper, both of 1 Reuben Street, Jerusalem, Israel

Filed Dec. 20, 1971, Ser. No. 209,907
Claims priority, application Israel, Jan. 7, 1971, 35961
Int. Cl. F23n
U.S. Cl. 431—19 **7 Claims**

An oil burner system for a furnace comprises a plural-speed electrical motor, a fuel pump, an air blower driven by the motor, an air conduit leading from the air blower to the oil burner, a plurality of oil conduits leading from the fuel pump to fuel nozzles in the oil burner, a solenoid-actuated valve in each of the oil conduits, a temperature and/or pressure sensor

for sensing the temperature in the furnace, and a relay controlled by the temperature sensor for reducing or increasing



the speed of the motor and for closing or opening one of the valves, thereby to reduce or increase the quantity of air fuel supplied to the burner.

3,732,058

APPARATUS FOR IGNITING PERCUSSIVELY OR ELECTRICALLY FIREABLE FLASH UNITS

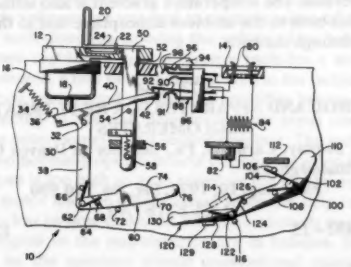
Wolfgang Ort, 7 Stuttgart 1, and Gerhard Brauning, 7050 Waiblingen, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 1, 1970, Ser. No. 148,357

Claims priority, application Germany, June 13, 1970, P 20 29 231.3; July 31, 1970, P 20 38 113.9; Aug. 29, 1970, G 70 32 349.8

Int. Cl. F21k *5/02*

U.S. Cl. 431—93 **17 Claims**



Photographic apparatus which can receive and actuate both percussively and electrically fireable flash units has percussive firing means and piezoelectric firing means selectively actuable in response to application of the same actuating force. Disclosed structure includes a blocking lever for disabling either the percussive firing means or the piezoelectric firing means in response to receipt of the other type of flash unit.

In another embodiment, means are included for simultaneously firing both types of flash units.

In another embodiment, the piezoelectric firing means is operable when there is either no percussively fireable flash unit present or a previously fired percussively fireable unit is present.

In other embodiments, the percussive and piezoelectric firing means, blocking lever and flash actuating means are incorporated within adapters for use with cameras which have no flash capability or which are able to fire only one type of flash unit.

3,732,059

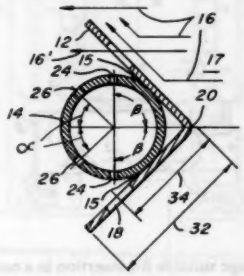
BURNER FOR GASEOUS FUELS IN REDUCED OXYGEN AND/OR SIGNIFICANT VELOCITY ATMOSPHERE

Hershel Goodnight; John S. Zink, and Robert D. Reed, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed May 28, 1971, Ser. No. 148,054

Int. Cl. F23l *19/04*

U.S. Cl. 431—286 **14 Claims**



This invention describes a burner system for burning gaseous fuels in an atmosphere containing oxygen less than that of air and/or in an atmosphere of significant flow velocity. It comprises one or more burner-baffle arrays which may be mounted singly, or in spaced parallel arrangement across the flow of said oxidizing atmosphere. Each array includes longitudinally spaced V-shaped angular baffles placed with the convex surface toward the gas flow. A gaseous fuel conduit connects with the concave downstream side of the baffle within the V angle formed by the side walls. Fuel gas inlet ports are spaced along the length of the conduit. Openings are provided in the walls of the baffles, spaced in direct relation to the positions of said ports.

3,732,060

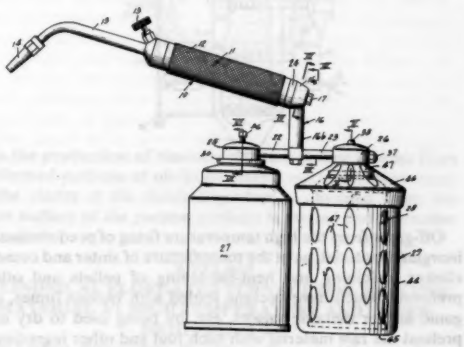
WELDING AND CUTTING UNIT

John P. Churchill, Indiatlantic, and Tommy Lewis Thompson, Melbourne, both of Fla., assignors to Life Support, Inc., Melbourne, Fla.

Filed May 17, 1971, Ser. No. 143,854

Int. Cl. F23d *13/04*

U.S. Cl. 431—344 **8 Claims**



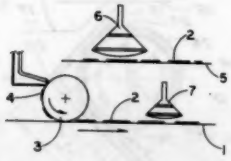
A lightweight, portable apparatus for welding or cutting supplied with fuel and oxygen from canisters, one of which houses a chemical oxygen generator. The canisters may be suspended directly from the welding or cutting torch or may be connected thereto through flexible hoses. When suspended from the torch, the canisters may be rotated to desired out-of-the-way positions. The oxygen generator canister is encased in a heat shield and a relief valve is provided to prevent undesired pressure build-up in the generator.

3,732,061

REINFORCED PAGE AND METHOD OF PRINTING ON SAME

Kenneth Lewis Hackley, Oxford, Ohio, assignor to Champion International Corporation, Knightsbridge, Ohio

Filed June 3, 1971, Ser. No. 149,431
Int. Cl. F27b 9/14
U.S. Cl. 432—10 **5 Claims**



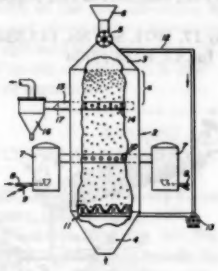
A reinforced page suitable for insertion in a notebook or the like has along one edge a plastic with a metal or metallized surface for reinforcement. Holes extend through the metal and plastic. The method of printing with such a page involves passing the page through a printing or copying device where it is exposed to heat, such as a xerographic dry copier, with the metal surface facing toward the heat source.

3,732,062

METHOD OF AND APPARATUS FOR REDUCING AIR POLLUTION IN THE THERMAL PROCESSING OF ORES AND OTHER MATERIALS

John H. Porteus, 1300 S. 27th Place, Apt. A-4, Birmingham, Ala.

Filed Jan. 20, 1972, Ser. No. 219,484
Int. Cl. F27b 1/00
U.S. Cl. 432—16 **13 Claims**



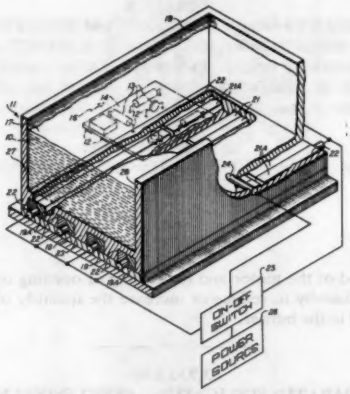
Off-gases from the high temperature firing of predominantly inorganic material, as in the manufacture of sinter and cement clinker, calcining and heat-hardening of pellets and other preforms, which have become fouled with various fumes, organic and/or metallic vapors, etc. by being used to dry and preheat the raw material with such fuel and other ingredients as may be mixed with the raw material, are recycled to a zone where they again pass through the highly-heated hot product to incinerate any burnable fumes or other contaminants in the recycled gases. All or part of such gases are then exhausted to the atmosphere while any part of said gases that are not exhausted mix with and are recycled along with the off-gases being currently generated in the process. Shaft furnaces, traveling grate pelletizing and sintering bands, and combination systems are constructed for such recycle of the contaminated off-gases.

3,732,063

METHODS FOR SOLDERING BY UTILIZING A SOLDER BATH HAVING A THERMAL GRADIENT

Vincent A. Corsaro, Haverhill, and Norman F. Smith, Methuen, both of Mass., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed May 20, 1971, Ser. No. 145,244
Int. Cl. F27b
U.S. Cl. 432—29 **3 Claims**



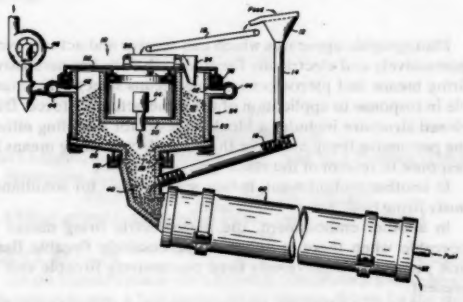
When mass soldering connections on a printed circuit board or other article by advancing the board across the surface of a solder bath, heat transfer to the board, icicle-like formations on the connections and uneven coating on the board are each minimized by utilizing an increasing temperature gradient along the path over which the board or article travels. The temperature gradient may be established and maintained because solder is a relatively poor conductor of heat. The temperature gradient is initially achieved and controlled by selectively controlling the heat applied to the bath so that more heat is applied to the exit portion of the bath than to the entrance portion. The temperature gradient is also influenced by heat losses both to the ambient atmosphere and to the boards passing through the bath.

3,732,064

METHOD AND APPARATUS FOR HEAT TREATING AGGLOMERATES

Louis H. Jaquay, Carnegie, Pa., assignor to Dravco Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1971, Ser. No. 170,590
Int. Cl. F27b 7/02
U.S. Cl. 432—13 **12 Claims**



A method and apparatus for heat treating agglomerates is disclosed. The larger particles are separated from the fines, and the larger particles are then discharged to a preheater where they are heated to a temperature above the desired heat

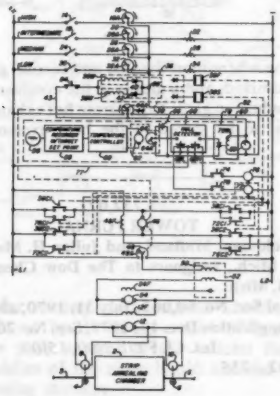
treating temperature. The thus heated larger particles are then combined with the separated fines in such a manner to effect heating of the fines by the larger particles such that the temperature of the mixture is reduced to below the desired heat treating temperature. The heated mixture of the larger particles and fines is then heated at the desired heat treating temperature.

3,732,065

STRIP ANNEALING LINE TEMPERATURE CONTROL SYSTEM

John A. Crawford, Concord, Calif., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 21, 1971, Ser. No. 182,332
Int. Cl. F27b *9/28*
U.S. Cl. 432—45 **6 Claims**



A continuous strip annealing line has potentiometers which determine the speed of the line, a pilot motor operating a first rheostat whose setting causes changes in line speed, a second rheostat operated by the pilot motor, and control means between the potentiometers and second rheostat operable when their voltages are unequal to cause rotation of the pilot motor in such direction to bring the voltages into balance. A temperature regulation control system includes a strip temperature sensor, a null detector connected to the output of the temperature sensor, and a magnetic amplifier having its output connected to the null detector and its input connected across the potentiometer and second rheostat. The null detector has two normally open contacts one closing when the strip temperature is too high so as to speed up the line by operating the pilot motor and the other closing when the strip temperature is too low to slow down the line. The contacts open when the two inputs to the null detector are in balance. Switches operable by the operator permit conventional operation or operation of the temperature regulation control and in conjunction with the potentiometers permit change from temperature regulation to conventional operation without changing line speed.

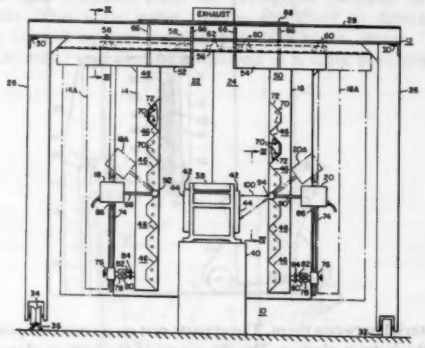
3,732,066

OVEN FOR CONTROLLING HEATING AND CURING OF RESINOUS INSULATING MATERIAL

Harry P. Kipple, Pittsburgh, Pa.; Virgil J. Cozzarin, Clarence, N.Y., and Francis C. Kapperman, deceased, late of Eggertsville, N.Y. (by Dorothy M. Kapperman, administratrix), assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 16, 1970, Ser. No. 89,797
Int. Cl. F27b *3/02*
U.S. Cl. 263—2 R **6 Claims**

An oven for heating and curing a powder of heat hardenable resinous material that has been applied to the portions of coil windings in a slot of a magnetic core as well as to the coil end turns including at least two heating panels disposed at spaced distances from the coated coil windings, the panels having a plurality of infrared radiant energy sources directed towards the coil windings, the panels being movable toward and away from the position of the coil windings, and control means associated with the panels for measuring the temperature of the resinous coating on the coil windings during the heating and curing operation, which means are operatively connected to the circuit of the infrared heat sources for turning the source on and off at prescribed intervals.

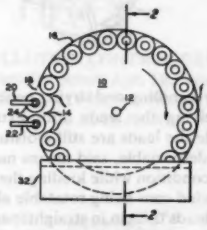


3,732,067

APPARATUS FOR SURFACE TREATMENT OF INTERIOR OR PARISON PREFORM

Richard K. Young, and Calvin D. Dockery, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 850,783, Aug. 18, 1969, Pat. No. 3,655,848. This application Nov. 4, 1971, Ser. No. 195,574
Int. Cl. F27b *9/16*
U.S. Cl. 432—85 **4 Claims**



In the production of biaxially oriented hollow articles from preformed parisons of olefin polymers, marked improvement in the clarity of the finished product is obtained when the inner surface of the parison preform is melted and thereafter quenched.

3,732,068

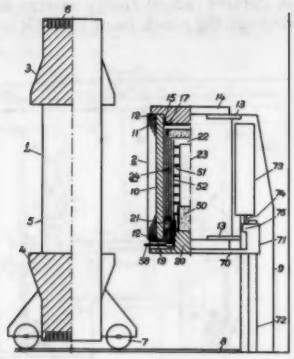
CYLINDRICAL ELONGATED FURNACE FOR TREATING MATERIAL AT HIGH TEMPERATURE AND UNDER HIGH PRESSURE

Hans Larker, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed July 1, 1971, Ser. No. 158,742
Claims priority, application Sweden, July 10, 1970, 9594/70
Int. Cl. F27b *3/02*
U.S. Cl. 432—120 **9 Claims**

A vertical furnace for treating material at high temperature and under high pressure has a stand into which a cylindrical pressure chamber is introduced. This stand is formed of a high pressure cylinder with top and bottom end closures which pro-

ject into the cylinder. A furnace chamber is formed within the pressure cylinder by two hat-shaped parts with insulating



material between them. These parts rest on an annular portion of the bottom closure. The inner part of the bottom closure is removable for charging the furnace.

3,732,069

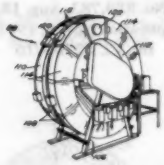
APPARATUS FOR HANDLING AND DRYING PENCIL LEADS

Verlon E. Wiser, Shelbyville, and Charles W. McCallie, Bell Buckle, both of Tenn., assignors to James Talcott Inc., Boston, Mass.

Division of Ser. No. 879,381, Nov. 24, 1969, Pat. No. 3,586,298. This application March 15, 1971, Ser. No. 124,231

Int. Cl. F27b *9/16*

U.S. Cl. 263—7 **3 Claims**



Apparatus for handling and drying pencil leads comprising means for receiving the leads after extrusion and cutting thereof but while the leads are still moisture laden and hence limp and easily deformable, said means maintaining the leads in straightened condition while loading the leads into cylindrical cans, the loaded cans being rotatable about their own axes to maintain the leads therein in straightened condition, the apparatus further comprising a rotary furnace for receiving the loaded cylindrical cans to effect drying of the leads, said rotary furnace comprising a rotor that slowly moves the loaded cans through an annular heating chamber, the loaded cans being mounted on discs which are rotatably mounted on the rotor, and drive means for simultaneously imparting rotation to the rotor and to the discs, the rotation of the latter being at a substantially greater rate than the rotation of the former, whereby as the rotor slowly carries the loaded cans through the heating chamber, the discs are simultaneously rotating about their own axes.

3,732,070

BURNER

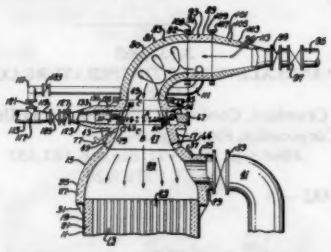
Joseph A. Vietorisz, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed March 31, 1971, Ser. No. 129,868

Int. Cl. F23l *9/00*

U.S. Cl. 263—19 R **17 Claims**

A burner used in conjunction with heat exchangers or furnaces has a chamber that is divided into a gas-mixing zone and a combustion zone, a means for axially introducing selected amounts of a relatively slow-flowing combustion supporting first gas into the mixing zone, a means for radially introducing selected amounts of a relatively rapid-flowing combustion supporting second gas as a plurality of gas streams into the gas



mixing zone whereupon the first and second gases become intimately admixed, and a means in the combustion zone for igniting the admixed gases to generate hot exhaust gases for supplying heat to be stored in the heat exchanger or utilized otherwise.

3,732,071

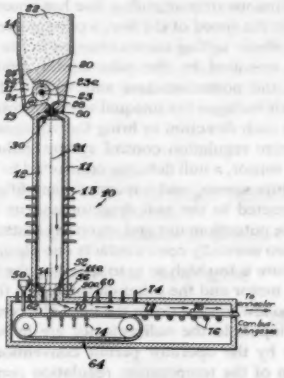
TOWER FURNACE

Nathan Waldman, Midland, and Julian H. Meserve, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 60,062, July 31, 1970, abandoned. This application Dec. 17, 1971, Ser. No. 209,320

Int. Cl. F27b *3/00*, *15/00*

U.S. Cl. 432—235 **6 Claims**



Disclosed herein is an improved apparatus and process for the manufacture of foamed ceramic material. The process comprises passing particles of a bloatable composition downwardly in a continuous planar curtain through an elongated heating zone, thereby to heat the particles above their melting temperature, and either cooling the particles to form expanded aggregate or alternatively collecting the particles while they are still molten to form a slab of foamed ceramic material. The improved apparatus comprises a tower furnace having an elongated serrated drum feeder positioned to discharge particles into the furnace in the form of a uniform curtain. The improved process and apparatus are especially advantageous to ceramic foam manufacture in that, as collected, the particles form a foamed ceramic slab of relatively uniform density and cell structure and of a generally rectangular cross-section.

3,732,072

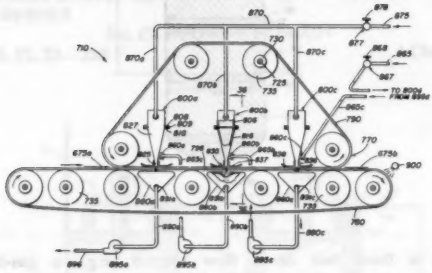
METHOD FOR RINSING FABRIC ARTICLES

Erwin B. Bahnsen, Hinsdale, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

Original application Nov. 25, 1969, Ser. No. 879,764. Divided and this application Sept. 28, 1971, Ser. No. 184,575

Int. Cl. B05b *7/00;* B05c *5/02*

U.S. Cl. 8—149.1 3 Claims



A method for rinsing cloth articles wherein the cloth articles are rinsed by directing a mist of gas and rinse liquid along a path normal to the articles therethrough to prevent puddles of the rinse liquid and the wash solution from forming thereon.

3,732,073

N,N-DIETHYLAZIRIDINIUM CHLORIDE AS A COREACTANT CATALYST FOR REACTIONS OF N-METHYLOL REAGENTS WITH CELLULOSE

Stanley P. Rowland, Earl J. Roberts, and Clinton P. Wade, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

Filed Mar. 28, 1972, Ser. No. 238,869

Int. Cl. D06m *15/58, 15/56, 13/48*

U.S. Cl. 8—183 9 Claims

N,N-diethylaziridinium chloride (DAC) is a coreactant catalyst for the reaction of cellulose with a broad variety of N-methylol compounds. This catalyst is effective in promoting reaction between cotton and individual N-methylol reagents or combinations of those reagents. The DAC was found especially effective as delayed-cure cross-linking processes. Little reaction occurred during delay periods up to 33 days and no increases in recovery angles were found in the delayed and uncured samples. The delayed-but-cured samples showed crease-recovery angles equal to those achieved in immediate cures.

3,732,074

SCALE METER

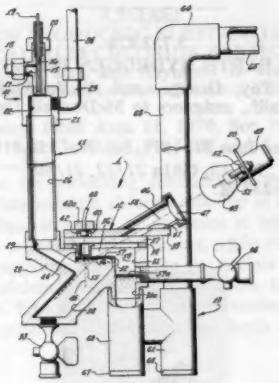
Herbert Feitler, Jr., 10346 Mississippi Ave., Los Angeles, Calif. 90025

Filed Jan. 6, 1971, Ser. No. 104,311

Int. Cl. G01n *21/28, 33/18*

U.S. Cl. 23—230 R 21 Claims

A scale meter comprising a mixing head for mixing a reagent and a water sample to cause the precipitation of particles in the water, a holding tube to allow the precipitate particles to grow to a detectable size, and a detector cell having a light source and a photo cell to detect light scattered from the precipitate particles in the water. This scale meter can be employed to determine the critical or true scaling pH of a given water. This scale meter can also be employed in a scale preventative system for a water system. In a scale preventative system the signal from the photo cell is amplified and compared in a comparator to a second signal which is equivalent to a signal from a water having scale conditions. When the amplified signal is larger than the second signal the comparator actuates means for preventing scaling in the water system.



3,732,075

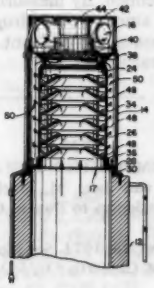
AIR POLLUTION CONTROL DEVICE

Peter Acaba, 605 East 6th Street, Apt. 1E, New York, N.Y.

Filed Dec. 16, 1970, Ser. No. 98,783

Int. Cl. B01d *50/00*

U.S. Cl. 23—284 5 Claims



An air pollution control apparatus for removing pollutants from exhaust gases prior to discharge into the atmosphere

which includes both mechanical and chemical filtering of the gases. The gases are drawn through a housing containing a plurality of spaced baffle members surrounded by a porous filter material for precipitating and trapping particulates; a chemical filter further reacts with the gases to neutralize noxious substances therein. A suction impeller in the housing is utilized for maintaining and controlling the gas flow through the filters and for discharging the purified gas through exhaust ports in the housing. The filters are furthermore advantageously removably mounted to permit for the easy disposal of pollutants collected and for replacement of the filters when necessary.

3,732,076

RARE EARTH HYDROGEN DETECTOR

Stephen M. Toy, Orange, and Austin Phillips, Santa Monica, Calif., assignors to McDonnell Douglas Corporation

Filed June 21, 1971, Ser. No. 155,019
Int. Cl. G01n *21/12, 21/60*
U.S. Cl. 23—232 R **10 Claims**

Hydrogen emanation and distribution at microstructural features to one micron size and below and bulk hydrogen to .001 part per million is detected with a rare earth metal detector system. The system operates on the basis of a chemical reaction of a rare earth metal with hydrogen. The rare earth metal is applied to the surface of the specimen to be examined and allowed to react with the hydrogen therein to form a metal hydride. In most rare earth metals, a color change occurs at the hydride reaction sites so that hydrogen emanation areas can be located on the specimen. By measuring the volume of the hydride sites, the amount of hydrogen reacted with the rare earth, and hence the amount of hydrogen in the specimen can be calculated.

3,732,077

METHOD AND COMPOSITION FOR DETERMINING BUN

Lowell B. Foster, and Jane M. Hochholzer, both of Birmingham, Ala., assignors to Damon Corporation, Needham Heights, Mass.

Filed Oct. 29, 1971, Ser. No. 193,973
Int. Cl. G01n *33/16, 21/24*
U.S. Cl. 23—230 B **3 Claims**

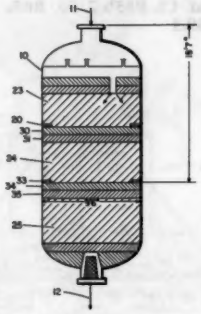
Blood serum is tested for the presence of urea nitrogen by reacting urea present in the serum with an aqueous reagent having a pH of between 0.4 and 1.5 and containing diacetylmonoxime, phenazone, arsenic pentoxide and sulfuric acid. Reaction is effected by heating the serum-reagent mixture to 85° to 100° C., cooling and measuring the optical absorbance of the cooled mixture at a wavelength between 450 and 485 nm.

3,732,078

FLOW REDISTRIBUTOR FOR A FIXED BED DOWN FLOW REACTOR

John R. Kassarjian, Detroit, Mich., assignor to Marathon Oil Company, Findlay, Ohio

Filed April 16, 1971, Ser. No. 134,776
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 R **7 Claims**



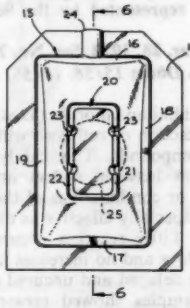
In a fixed bed down flow reactor, e.g., a gas-oil hydrotreater, there is installed a deflector, e.g., a 6-inch wide rim around the inside perimeter of the reactor and a load of low flow resistance particles, e.g., balls, is loaded immediately below the rim so that channeling is redistributed.

3,732,079

DISPOSABLE PLASTIC SYRINGE FOR USE IN COLORIMETRY

Ward B. Davis, Glendale, Calif., assignor to Sterilizer Control Royalties, North Hollywood, Calif.

Continuation-in-part of Ser. No. 800,887, Feb. 20, 1969, Pat. No. 3,620,676. This application Feb. 3, 1971, Ser. No. 112,234
Int. Cl. G01n *1/14, 31/22*
U.S. Cl. 23—253 TP **6 Claims**



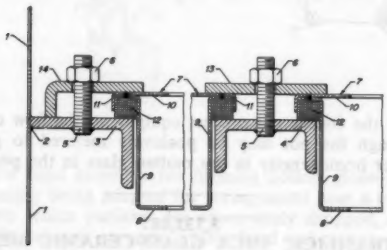
A disposable plastic syringe particularly for use in colorimetry is formed by embossing a sheet of transparent synthetic plastic, or otherwise forming in it, a bulbar cavity, and subsequently closing the cavity by adhering a plane synthetic plastic sheet over the cavity, the two sheets being either heated sealed or adhesively joined together at the margins around the cavity. The cavity is connected to the outside edge of the device by an embossed groove which when attached to the plane sheet forms a tubular inlet or outlet. The cavity is shaped as a truncated pyramid with a turret closing the top, this turret forming a finger-pressable "button" by which the syringe will draw in or expel liquid through the tubular connection to the margin of the device. The volume of

liquid drawn into each specimen syringe is relatively accurately measured. A partial coating, such as a stripe or spot, inside the bulbar cavity using a color-change-indicator composition provides means for making a colorimetric determination of the acidity or the content of some individual constituent of the liquid drawn into the syringe device.

3,732,080
PANEL-SHAPED CATALYTIC ELEMENT WITH FASTENING MEANS

Joachim Klepitko, An Der Burgmuehle 1, 646 Gelnhausen, Germany

Filed March 1, 1971, Ser. No. 120,030
Claims priority, application Germany, March 12, 1970, G 70 09 055.0
Int. Cl. B01j *9/04*; F01n *3/14*
U.S. Cl. 23—288 F **4 Claims**

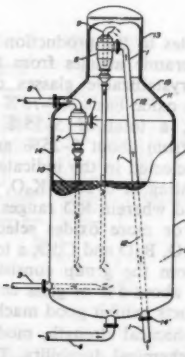


Panel type catalyst elements with peripheral flanges that provide a U-shape profile to hold a gasket member provide for easier and improved clamped attachment to spaced supporting frame members.

3,732,081
APPARATUS FOR FLUID-SOLID CONTACTING OPERATIONS

Don B. Carson, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 27,784, April 13, 1970, Pat. No. 3,607,129. This application May 20, 1971, Ser. No. 145,352. The portion of the term of this patent subsequent to Sept. 21, 1988, has been disclaimed.
Int. Cl. B01j *9/20*
U.S. Cl. 23—288 S **8 Claims**



An apparatus comprising a riser reaction zone and a reaction zone vessel, said vessel having disposed therein a first and second particle separation means, the second particle separation means is connected to said riser reaction zone which passes into said vessel through its lowermost portion. The first particle separation means is connected to an outlet stream passing out of the reaction zone vessel. The apparatus is applicable for use in catalytic cracking operations, fluidized dehydrogenation operations, or any fluid-solid catalytic operation in which fluidized catalysts are utilized to effectuate a reaction. In a particular instances the apparatus may be used to perform a riser reaction and a dense fluidized bed contacting simultaneously.

3,732,082
METHOD OF PRODUCING SUBSTANTIALLY DUST FREE CALCIUM CHLORIDE PARTICULATE

Robert S. Kolat, Bay, and Raymond K. Hudson, Caro, Mich., assignors to The Dow Chemical Company, Midland, Mich.

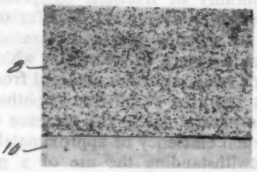
No Drawing. Filed Aug. 11, 1970, Ser. No. 63,004
Int. Cl. B01j *6/00*; C01f *11/18*
U.S. Cl. 23—304 **12 Claims**

A process for producing substantially dust and fines free particulate calcium chloride wherein at least the particulate surface is glazed by exposure to heat above the temperature at which a glaze occurs, while simultaneously preventing agglomeration of the particulate by agitation until the calcium chloride surface cools to below this temperature. Exposure time to temperatures in excess of the glaze temperature determines the depth of the glazed zone.

3,732,083
COMPOSITE ARTICLE

Gordon J. Le Brasse and Victor Gallatin, Ann Arbor, Mich., assignors to Federal-Mogul Corporation

Filed Aug. 13, 1970, Ser. No. 63,419
Int. Cl. B32b *15/20*
U.S. Cl. 29—197 **5 Claims**



An aluminum based bearing alloy and bearing components fabricated therefrom which comprises from about 3.5% to about 4.5% tin, from about 3.5% to about 4.5% silicon, from about 0.7% to about 1.3% copper and the balance substantially all aluminum, along with conventional impurities.

3,732,084
EMULSIFIED CARBON FUEL

James Nixon and Alan Beerbower, Westfield, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed June 16, 1969, Ser. No. 833,661
Int. Cl. C10l *1/32*
U.S. Cl. 44—51 **11 Claims**

A stable, semi-solid or pseudoplastic emulsion containing unusually high amounts, e.g. 60 wt. percent of elemental carbon is prepared by coating finely-divided carbon with an emulsifier and thereafter admixing the emulsifier-coated carbon particles with a liquid hydrocarbon, an emulsifier, and a polar organic liquid to form an emulsified carbon fuel having as the dispersed phase a major

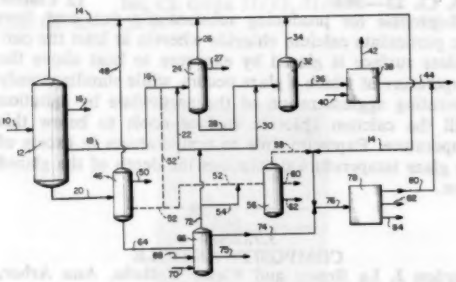
proportion of the hydrocarbon, e.g. jet fuel, and as the continuous phase a minor proportion of the polar organic liquid, e.g. formamide-urea mixtures. Such fuels typically have yield stresses in the range of 1,000–10,000 dynes/cm.^{2}, are readily pumpable and are useful as fuels in air-breathing rockets.

3,732,085

THERMALLY EFFICIENT NONPOLLUTING SYSTEM FOR PRODUCTION OF SUBSTITUTE NATURAL GAS

Norman L. Carr, Allison Park, Warren A. Roe, Jr., Upper St. Clair, and Harry C. Stauffer, Cheswick, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 4, 1971, Ser. No. 150,146
Int. Cl. C07c *9/04*
U.S. Cl. 48—214 **12 Claims**



Sulfur-free, methane-rich substitute natural gas is produced from a high sulfur crude oil by a nonpolluting process capable of achieving an unexpectedly high thermal efficiency. The process comprises separating whole crude oil into a plurality of fractions comprising a bottoms fraction and a lighter oil fraction, desulfurizing and hydrocracking the oil fraction into a substantially sulfur-free naphtha in the presence of hydrogen, which is provided by converting a residue portion obtained from the bottoms fraction. The resulting sulfur-free naphtha is converted into substitute natural gas in the presence of steam. Not only is a thermal efficiency of approximately 100 percent obtained, notwithstanding the use of a portion of the crude oil for refinery fuel, but naphtha is produced at a volumetric efficiency of about 100 percent based upon the crude oil feedstock. The system is autogenic with respect to hydrogen requirements for desulfurization, nitrogen removal, and hydrocracking.

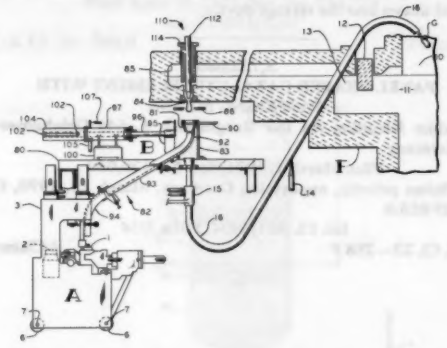
3,732,086

METHOD AND APPARATUS FOR RECOVERING DISCRETE GOBS OF MOLTEN GLASS

Clarence A. Heyne, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Dec. 28, 1970, Ser. No. 101,845
Int. Cl. C03b *5/26*
U.S. Cl. 65—28 **14 Claims**

Embodiments are disclosed of means for recovering discrete gobs of molten glass for reuse. A conduit has an entrance end located to receive the discrete gobs of molten glass from a gob feeding means and an exit end positioned to deliver recovered gobs received by the conduit to a molten glass supplying means. The discrete gobs are conveyed through the conduit means by supplying fluid under pressure or creating a vacuum in the conduit to urge the discrete gobs to the melting tank of a furnace. The gob recovery system may be utilized with IS molding machines, Owens pot process machines, and the like. Whenever the discrete gob forming apparatus is utilized



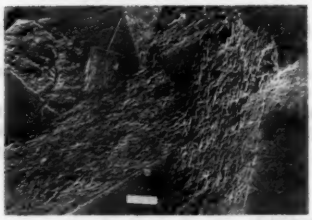
with the Owens pot process equipment, the flow of glass through the pot may be positively metered to provide better homogeneity in the molten glass in the pot.

3,732,087

TETRASILICIC MICA GLASS-CERAMIC METHOD

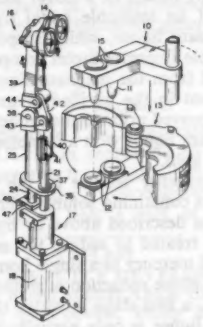
David G. Grossman, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 24, 1971, Ser. No. 117,933
Int. Cl. C03b *29/00*; C03c *3/22*
U.S. Cl. 65—33 **3 Claims**



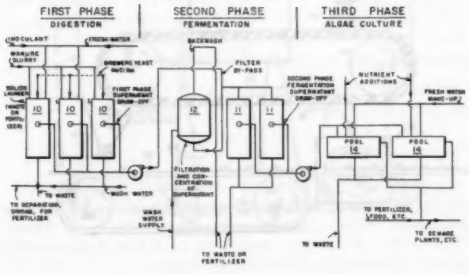
This invention relates to the production of tetrasilicic fluorine mica glass-ceramic articles from the controlled heat treatment of crystallizable glasses containing, in weight percent on the oxide basis, 45–70% SiO_2, 8–20% MgO, 8–15% MgF_2, a total of 5–35% $[R_2O+RO]$, wherein R_2O ranges from about 5–25% and consists of one or more oxides selected in the indicated proportions from the group consisting of 0–20% K_2O, 0–23% Rb_2O and 0–25% Cs_2O, and wherein RO ranges from 0–20% and consists of one or more oxides selected from the group consisting of SrO, BaO and CdO, a total of 0–10% of oxides selected from the group consisting of As_2O_5 and Sb_2O_5, and up to about 5% of glass colorants. These tetrasilicic mica products exhibit good machinability with steel tools, good mechanical strength, moderate thermal expansion and good chemical durability. The use of the optional constituents As_2O_5, Sb_2O_5 and the glass colorants permits the production of translucent glass-ceramics and glass-ceramics having the appearance of marble.

3,732,088
BLOW HEAD ASSEMBLY
Anthony T. Zappia, 7576 Ivywood Drive, Apt. A, Indianapolis, Ind. 46250
Filed Aug. 30, 1971, Ser. No. 176,054
Int. Cl. C03b *9/14*
U.S. Cl. 65—261 **6 Claims**



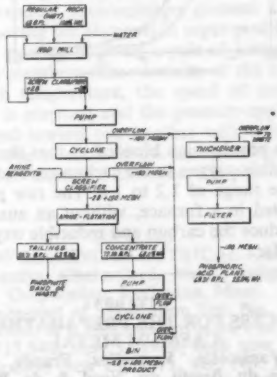
A blow head assembly for forming hollow glassware, the assembly being adapted for arrangement near a blow mold into which parisons are successively dropped, and comprising an arm carrying a blow head and mounted to swing about a horizontal axis between a horizontal position in which the arm overlies the mold with the blow head in spaced registry with the mold, and an elevated positioned in which the arm is laterally withdrawn from the mold, the pivotal mounting for the arm being carried by a post arranged for limited rectilinear reciprocation, and a reciprocator parallel with the line of reciprocation of the post, operative to swing the arm between its stated positions and effective to cause the post to move synchronously with the reciprocator when the arm is in horizontal position to shift the blow head rectilinearly into and out of mating engagement with the mold.

3,732,089
PROCESS FOR PRODUCING MICRO-ORGANISMS
Charles K. Megronigle, 1801 Baltimore Pike, Springfield, Pa. 19064
Filed Aug. 16, 1971, Ser. No. 171,919
Int. Cl. C05f *11/08*
U.S. Cl. 71—8 **13 Claims**



The processing of the excrement of lactating cows is disclosed having a digestion phase, a fermentation phase and an algae culture phase. In the digestion stage a slurry of excrement of lactating cows is reacted with brewer's yeast, sodium chloride, an inoculant and water to provide a first phase supernantant for use, separated from wastes, in the second phase. In the second or fermentation phase the first supernatant is filtered, concentrated and fermented, wastes separated, and a second supernatant drawn off for use in the third or algae culture stage. In the latter stage nutrients and fresh water are added to the second supernatant which is held in pools with withdrawal of the wastes and separation of a culture useful in the treatment of animal wastes, sewage and waste waters and products useful for a variety of purposes including reduction of odors, increased oxidation in sewage effluent, degreasing of sewer conduits and plant equipment, accelerated settlement of sewage solids, foaming reduction and control, nitrogen and phosphorous level reductions in sewage plant effluent, accelerated cellulose fiber degradation, organic soil additives, and animal feed supplement and/or additives.

3,732,090
PROCESSING OF PHOSPHATE ROCK
Harvie W. Breathitt, Jr., Lakeland, Robert D. Evans, Pierce, and Wesley M. Houston, Lakeland, Fla., assignors to Agrico Chemical Company, Tulsa, Okla.
Continuation of application Ser. No. 633,319, Mar. 3, 1967, which is a continuation-in-part of application Ser. No. 365,269, May 6, 1964, both now abandoned. This application Feb. 17, 1971, Ser. No. 116,244
Int. Cl. C05b *11/04*
U.S. Cl. 71—37 **6 Claims**



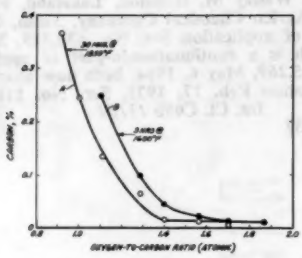
Phosphatic pebble is up-graded by subjecting a slurry of phosphate matrix to the steps of washing and size classification, with the phosphatic pebble resulting from the classification being subjected to wet grinding; the fines from wet grinding are suitable for acidulation to produce a fertilizer material, and the coarser fraction from wet grinding is further beneficiated by flotation.

3,732,091
METHOD FOR PREPARING MUTUAL DISPERSIONS OF CARBIDES AND METALS OR ALLOYS AND NOVEL PRODUCTS THEREOF
René A. Paris and Dominique Thibaudon, Lyon, Marc P. Roubin, Villeurbanne, and Jacques M. Paris, Lyon, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Puteaux, France
Filed July 1, 1970, Ser. No. 51,470
Claims priority, application France, July 4, 1970, 6922753
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5 AC **9 Claims**

A mixed oxide, a co-precipitate of hydroxides or a mixed complex of a first metal providing the carbide of

the dispersion and of a second metal providing the metal of the dispersion are subjected to a heat treatment in an enclosure. The compound thus obtained is subjected, in a reducing and carburizing atmosphere containing hydrogen and methane, to thermal treatment below 1100° C. to reduce all the oxides and carburize the first metal. Heating is effected at a speed of 100 to 400° C./hour. The dispersions comprise particles of single or mixed carbides uniformly distributed in the midst of elementary grains of metal. The dispersions are used in powder metallurgy.

3,732,092
HEAT TREATMENT OF IRON POWDER
George E. Wieland, Jr., and Eugene M. Rudzki, Bethlehem, Pa., assignors to Bethlehem Steel Corporation
Filed Mar. 31, 1972, Ser. No. 239,970
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5 BA **8 Claims**



Raw iron powders are blended so that the atomic ratio of the reducible oxygen to the carbon content of the blend is within the range of 1.2 to 1.6. The raw powder blend is heat treated in a furnace, without an auxiliary atmosphere, to reduce the carbon and reducible oxygen contents of the powder.

3,732,093
PROCESS FOR THE PREPARATION OF CAESIUM METAL
Christian Vaniscotte, Vermelles, France, assignor to Houilleres du Bassin du Nord & du Pas-de-Calais, Douai, France
No Drawing. Filed Nov. 30, 1967, Ser. No. 686,847
Claims priority, application France, Dec. 2, 1966, 86,039
Int. Cl. C22b *27/00*
U.S. Cl. 75—66 **6 Claims**

This invention is concerned with a process for the preparation of caesium metal wherein an ore containing caesium is directly reacted with silicon in the presence of a sufficient quantity of lime at 1300° C. to yield the pure metal.

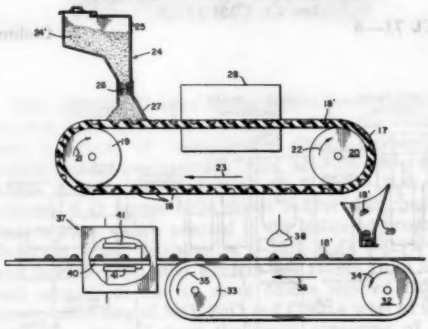
3,732,094
PROCESS FOR PREPARING ELEMENTAL MERCURY
Duane Brown, 104 E. Huntington Drive, Tempe, Ariz. 85281, and Alton R. Carlson, 720 E. Dobbins Road, Phoenix, Ariz. 85040
Filed June 29, 1970, Ser. No. 50,838
Int. Cl. C22b *3/00, 11/00, 43/00*
U.S. Cl. 75—101 R **11 Claims**

This application discloses a process for recovering mercury from various mercury-containing materials such as ores, ore concentrates, alloys, amalgams and compounds. According to one feature of the process, the mercury is extracted in the form of a soluble mercury complex by leaching the mercury source with a novel leach liquid. The novel leach liquid contains components which react during the leaching step to generate a hypohalite leach reagent in situ. The hypohalite, in turn, oxidizes the mercury or mercury compound which is then solubilized in the leach liquid to form a strong pregnant liquor.

According to another feature of the process, arsenic, selenium and tellurium impurities are separated from the pregnant liquor by means of a novel technique involving the formation of an insoluble metal hydroxide suspension in the pregnant liquor, which suspension selectively adsorbs the soluble impurity metal compounds which are in turn separated from the pregnant liquor. If gold compounds are present in the purified pregnant liquor, they are selectively removed prior to the reduction step by contacting the pregnant liquor with a combined reductant and adsorbent for the gold.

According to another feature of the invention, pregnant leach liquors containing soluble mercury complexes, either prepared as described above or by any other suitable process, are treated to reduce the mercury complex to form elemental mercury in a single homogeneous liquid phase. The liquid phase reduction is preferably carried out in two stages, i.e., a first stage in which the mercury content of the leach liquor is only partially reduced to form an insoluble mercury compound which is separated from the mother liquor. After separation of the partially reduced insoluble mercury compound, it is treated with an additional quantity of the reducing agent to complete the reduction of the insoluble mercury compound to elemental mercury.

3,732,095
METHOD OF MAKING POROUS ELECTRODES COMPRISING FREEZING WET POWDER AND SINTERING
Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Division of application Ser. No. 17,519, Mar. 19, 1970, now abandoned, and continuation-in-part of application Ser. No. 810,405, Sept. 13, 1968, which is a division of application Ser. No. 552,312, May 23, 1966. This application Aug. 23, 1971, Ser. No. 174,210
Int. Cl. B22f *1/00*
U.S. Cl. 75—211 **6 Claims**



A method for making porous anodes suitable for use in capacitors which involves forming moistened metal powder into a mass, freezing the moistened mass thereby bonding the metal powder together and sintering the mass to convert it to a porous pellet suitable for use as an anode for a capacitor.

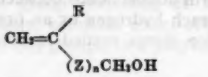
3,732,096

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE LAYER

Satoru Honjo and Masaaki Takimoto, Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 8, 1971, Ser. No. 105,051
Claims priority, application Japan, Jan. 8, 1970, 45/2,589
Int. Cl. G03g 5/00, 5/08
U.S. Cl. 96—1.5 15 Claims

An inorganic photoconductor is added to a binder which comprises a copolymer of a vinyl monomer and a component expressed by the following general formula



where R represents H or CH_3, Z represents $COO(CH_2)_m$, $CONHCH_2$ or OCH_2, *m* represents an integer of from 1 to 5, and *n* represents 0 or 1, an alkyd resin compatible with said copolymer and a polyisocyanate compound capable of crosslinking at least a part of said copolymer.

3,732,097

METHOD FOR DIRECTLY DEVELOPING A RELIEF IMAGE IN A POLYMERIZABLE COMPOSITION

John P. Dickie, Monroeville, Philip H. Harju, Spring Church, and David Kostishack, Verona, Pa., assignors to Koppers Company, Inc.

No Drawing. Filed Feb. 2, 1971, Ser. No. 112,082
Int. Cl. G03c 1/70, 5/00
U.S. Cl. 96—35.1 4 Claims

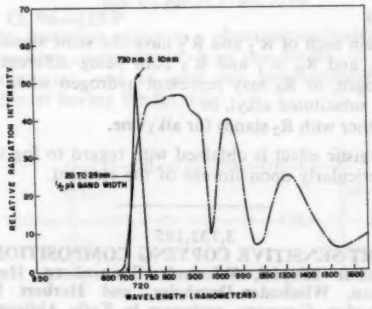
A process for directly developing a relief image in a polymerizable composition is disclosed. The process involves an image-wise exposure of a polymerizable layer to a beam of actinic light, and differentially polymerizing the layer under the influence of this imagewise exposure to form directly a polymerized casting in the form of a relief image. Also, mirror-relief images can be developed directly on opposite surfaces of the resultant polymerized casting. The castings can be used for printing plates, circuit boards, and can be used to make fluidic amplifiers.

3,732,098

RED LIGHT DEVELOPMENT OF FREE RADICAL SYSTEM WITHIN 50 NANOMETERS

Frederick W. Schmidt, Bedford Heights, Ohio, assignor to Horizons Incorporated, a Division of Horizons Research Incorporated

Filed Sept. 22, 1971, Ser. No. 182,703
Int. Cl. G03c 5/24, 5/04
U.S. Cl. 96—48 R 3 Claims



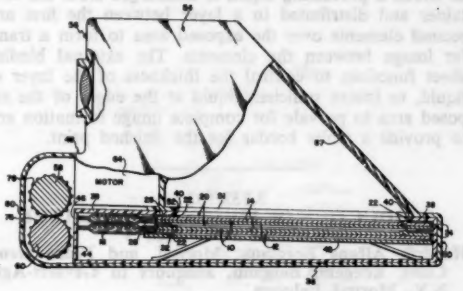
The process described in United States Pat. 3,510,300 is greatly improved by restricting the radiation used for developing visible images in non-silver free radical film to a very narrow band of wavelengths not broader than 50 nanometers.

3,832,099

TEMPERATURE SENSITIVE PRESSURE-APPLYING MEMBERS FOR A PHOTOGRAPHIC PROCESSING LIQUID

Richard Chen, Winchester, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Original application June 21, 1968, Ser. No. 738,954. Divided and this application Dec. 30, 1970, Ser. No. 102,934
Int. Cl. G03c 5/54
U.S. Cl. 96—29 R 4 Claims



A photographic process, in which a viscous photographic, processing liquid is distributed in a thin layer between an exposed photosensitive element and another element by moving the elements in super-position through a convergent passage between a pair of juxtaposed pressure-applying members. The viscosity of the liquid varies inversely with temperature, the speed of movement of the elements is constant and the pressure-applying members are biased toward one another with a force that is varied in inverse relation to the ambient temperature to insure uniform liquid distribution despite temperature changes.

3,732,100

METHOD OF MAKING ELECTRICAL CAPACITORS

James E. Genthe, Chelmsford, Mass., assignor to Itek Corporation, Lexington, Mass.

Continuation-in-part of application Ser. No. 9,389, Feb. 6, 1970, which is a continuation-in-part of application Ser. No. 717,502, Apr. 1, 1968, both now abandoned. This application Oct. 18, 1971, Ser. No. 190,296
Claims priority, application Great Britain, Mar. 28, 1969, 16,264/69
Int. Cl. G03c 5/00, 11/00
U.S. Cl. 96—38.4 6 Claims

An electrical component production method wherein an electrically conductive image electrode is exposed and photographically developed on the surface of a substrate supported photoconductive layer.

3,732,101

PHOTOGRAPHIC FILM UNIT

Edwin H. Land, Cambridge, and Albert J. Bachelder, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 5,799, Jan. 26, 1970, now Patent No. 3,619,192, which is a continuation-in-part of abandoned application Ser. No. 622,286, Mar. 10, 1967. This application June 21, 1971, Ser. No. 155,119
The portion of the term of the patent subsequent to Nov. 9, 1988, has been disclaimed
Int. Cl. G03c 1/48
U.S. Cl. 96—76 C 22 Claims

A photographic film unit comprising all of the materials required to produce a photographic print including a first element which is a photosensitive element, a second

element which may be a transparent image-receiving element, a binding element secured to the exterior margins of the first and second elements adjacent three sides of the area to be exposed and processed, and a container of processing liquid secured to the elements adjacent the remaining side of the exposure area. The binding element secures the first and second elements to one another along three sides of the exposure area and preferably also serves as the means for securing the container to the elements adjacent the remaining side of the exposure area. The film unit is designed to be maintained intact throughout and subsequent to exposure and processing in which a processing liquid is discharged from the container and distributed in a layer between the first and second elements over the exposed area to form a transfer image between the elements. The external binding sheet functions to control the thickness of the layer of liquid, to insure sufficient liquid at the edges of the exposed area to provide for complete image formation and to provide a white border for the finished print.

3,732,102

PRODUCTION OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS

Hendrik Alfons Borginon, Mortsel, and Frans Henri Claes, Edegem, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Continuation-in-part of abandoned application Ser. No. 774,190, Nov. 7, 1968. This application Mar. 12, 1971, Ser. No. 123,887

Claims priority, application Great Britain, Nov. 7, 1967, 50,631/67

Int. Cl. G03c *1/02*

U.S. Cl. 96—94 **3 Claims**

The formation of fine grains in a photographic silver halide emulsion formed in an ammonia-free gelatin medium is promoted by carrying out any or all of the significant steps in manufacturing and coating such emulsions under sub-atmospheric pressure, preferably below 100 mm. Hg.

3,732,103

SILVER HALIDE EMULSIONS CONTAINING ALKYL SELENOLS AND THIOLS AS ANTI-FOGGANTS

Arthur Herman Herz and Edwin Russell Wescott, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 3, 1971, Ser. No. 139,941

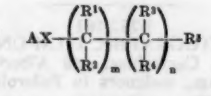
Int. Cl. G03c *1/34*

U.S. Cl. 96—109 R **9 Claims**

Photographic silver halide emulsions and elements comprising said emulsions are stabilized against fog by organic selenium derivatives and their sulfur-containing analogs. New alkyl selenols useful in fog stabilizing concentrations are likewise disclosed.

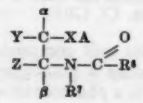
These fog stabilizing organic compounds have the structural formula:

(I)



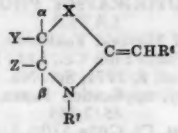
in which A is a cation, X is sulfur or selenium, R^1 to R^5 are each hydrogen or organic residues provided that at least one of said R^1 to R^5 is a sulfonic acid group or salt thereof and m and n are each about 0 to about 4 so that the sum of m and n equals a positive integer up to about 8;

(II)



or

(III)



in which A is a cation, X is sulfur or selenium, R^7 is an organic residue; R^6 is hydrogen or an organic residue; α and β are each hydrogen, organic residue or the electrons required to form double bonds between the carbon atoms; Y and Z are each hydrogen or an organic residue or together comprise atoms needed to complete a cyclic nucleus.

3,732,104

SILVER HALIDE EMULSIONS CONTAINING AZAINDENE AND AMIDE STABILIZING AGENTS

Hubert Vandenabeele, Wilrijk, Joseph Louis De Munck, Heide-Kalmthout, Robrecht Julius Thiers, Brasschaat, Robert Joseph Pollet, Vremde, Raymond Leopold Florens, Edegem, and Jozef Frans Willems, Wilrijk, Belgium, assignors to Gevaert-Agfa, N.V., Mortsel, Belgium

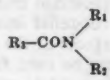
No Drawing. Filed Oct. 27, 1970, Ser. No. 84,489

Claims priority, application Great Britain, Nov. 3, 1969, 53,825/69

Int. Cl. G03c *1/34*

U.S. Cl. 96—109 **12 Claims**

Photographic materials comprising a light-sensitive silver halide emulsion element containing an azaindene emulsion stabilizing agent in contact with as an additional stabilizing agent an amide having the formula:



wherein

each of R_1 and R_2 stands for hydrogen, lower alkyl, lower alkyl carrying a hydroxyl group, lower alkyl carrying the group R_3CONH—, or a phenyl group,

R_1 together with R_2 stands for the atoms necessary to close a pyrrolidone, piperidine or morpholine nucleus,

R_3 stands for lower alkyl or the group

wherein each of R'_1 and R'_2 have the same significance as R_1 and R_2, R'_1 and R'_2 both being different from hydrogen, or R_3 may represent hydrogen when R_1 or R_2 is substituted alkyl, or

R_3 together with R_2 stands for alkylene.

A synergistic effect is obtained with regard to fog inhibition particularly upon storage of the element.

3,732,105

LIGHT-SENSITIVE COPYING COMPOSITIONS

Kurt-Walter Klupfel, Wiesbaden-Sonnenberg, Hartmut Steppan, Wiesbaden-Dotzheim, and Herbert Maar, Wiesbaden, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,139

Claims priority, application Germany, Oct. 30, 1970, P 20 53 363.5

Int. Cl. G03c *1/54, 1/70*

U.S. Cl. 96—115 P **10 Claims**

This invention relates to a light-sensitive copying composition which comprises at least one light-sensitive sub-

stance of which the solubility decreases on exposure and at least one high molecular weight binder which is soluble or swellable in aqueous-alkaline solutions, the binder being a reaction product of at least one sulfonyl-isocyanate of the general formula

$$R—SO_2—NCO$$

wherein R is selected from the group consisting of an alkyl or alkoxy group with 1 to 6 carbon atoms, an aryl or aryloxy group with 6 to 10 carbon atoms or a tertiary amino group, and as a second component a member selected from the group consisting of a vinyl alcohol polymer, epoxy resin, cellulose ester, cellulose ether or polyester with free OH groups, or a polyamine, polyamide or polyurethane.

3,732,106

LIGHT-SENSITIVE COPYING COMPOSITIONS

Hartmut Steppan, Wiesbaden-Dotzheim, Herbert Maar, Wiesbaden, and Kurt-Walter Klupfel, Wiesbaden-Sonnenberg, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,140
Claims priority, application Germany, Oct. 30, 1970, P 20 53 364.6
Int. Cl. G03c 1/70
U.S. Cl. 96—115 R **9 Claims**

This invention relates to a light-sensitive copying composition which comprises at least one light-sensitive unsaturated polymeric substance which is soluble, or at least swellable, in aqueous alkali, and at least one photoinitiator, the polymeric substance being a reaction product of a polymeric substance containing units with active hydrogen atoms, with at least one sulfonyl-isocyanate of the general formula

$$R—SO_2—NCO$$

wherein R is selected from the group consisting of an aliphatic or cycloaliphatic group with at least one olefinic double bond.

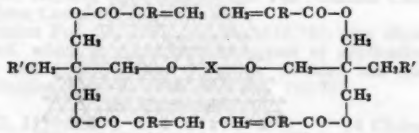
3,732,107

PHOTOPOLYMERIZABLE COPYING COMPOSITION

Raimund Josef Faust, Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

No Drawing. Filed Oct. 29, 1971, Ser. No. 193,985
Claims priority, application Germany, Nov. 2, 1970, P 20 53 683.8
Int. Cl. G03c 1/68, 1/70
U.S. Cl. 96—115 P **13 Claims**

This invention relates to a photopolymerizable copying composition comprising at least one binder, at least one photoinitiator, and at least one polymerizable unsaturated ester having the formula



in which

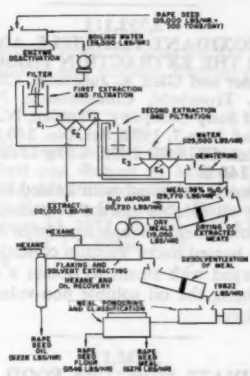
R is selected from the group consisting of hydrogen or a methyl group,
R′ is selected from the group consisting of hydrogen, a methyl group, or —O—CO—CR=CH_2, and
X is a diacyl group derived from a dicarboxylic acid having 2 to 12 carbon atoms.

3,732,108

RECOVERY OF AND SEED MEAT FROM THIOGLUCOSIDE-CONTAINING OILSEED

Kuttikandathil Eapen Eapen, Staten Island, N.Y.; Norman Wilson Tape, and Richard Paul Andrew Sims, both of Ottawa, Ontario, Canada, assignors to Canadian Patent and Development Limited, Ottawa, Ontario, Canada

Continuation-in-part of Ser. No. 805,619, March 10, 1969, abandoned. This application Dec. 17, 1971, Ser. No. 209,240
Int. Cl. A23l 1/20
U.S. Cl. 99—2 E **10 Claims**



There is described a process for obtaining protein-rich, substantially non-toxic, oilseed flour by subjecting certain oilseed to myrosinase inactivating temperatures in the presence of water, myrosinase being the enzyme responsible for liberation of toxic compounds upon enzymatic hydrolysis. The water-treated seeds are subjected to decortication so as to expose the seed meat, thioglucoside is substantially removed by extracting at least the exposed seed meat with cold or warm water, the water-extracted material is dried and oil is recovered. The process is particularly applicable to rapeseed and other related seeds and provides a protein-rich flour, suitable for human consumption or animal feeding, which may have a protein content of up to about 56–62 percent, rapeseed oil and, as a by-product, a seed coat rich meal which is useful for animal feeds.

3,732,109

READY-TO-EAT OAT CEREAL BISCUIT

Jeffrey G. Poat, Schaumburg, and Neal F. Smith, Libertyville, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 27, 1971, Ser. No. 110,248
Int. Cl. A23l 1/10
U.S. Cl. 99—83 **1 Claim**

A ready-to-eat oat cereal biscuit is produced by admixing oat flour and water, subjecting the mixture to a water boiling temperature and a superatmospheric pressure, releasing the pressure, forming flakes from the released pressure mixture, drying the flakes to a critical moisture content, subdividing the flakes to a specified size, mixing the subdivided pieces with syrup, then compacting the mixture to form a biscuit and drying the formed biscuits.

A ready-to-eat oat cereal biscuit is disclosed comprising finely subdivided oat flakes and syrup compressed together and dried to a moisture content from about 4 percent to 5 percent by weight.

3,732,110

PROCESS FOR PRODUCING RICOTTA CHEESE

Nicholas E. Pontecorvo, Tarzana, Calif., assignor to Pontecorvo R & D Company, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 39,721, May 22, 1970. This application Mar. 8, 1971, Ser. No. 121,709

Int. Cl. A23c *19/02*

U.S. Cl. 99—116 13 Claims

A heated mixture of whey and milk is processed simultaneously in a plurality of small adjacent cells by successive acidifying steps, to develop separate floating bodies of curd which are then collected in respective skimming baskets as residual whey is drained off below them, and are finally removed by simultaneously lifting the skimming baskets from the cells.

3,732,111

SPICE ANTIOXIDANT PRINCIPLE AND PROCESS FOR THE EXTRACTION THEREOF

David L. Berner and Glen A. Jacobson, Cherry Hill, and Charles D. Trombold, Cinnaminson, N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed June 7, 1971, Ser. No. 150,638

Int. Cl. A23l *1/22*; C07g *17/00*

U.S. Cl. 99—140 R 10 Claims

Ground spice is extracted with heated animal or vegetable oil. The oil soluble extract containing volatile and non-volatile components is separated from the spice solids. The extract is heated under vacuum conditions and simultaneously sparged with steam to obtain a deodorized oil extract containing the oil soluble non-volatile spice antioxidant principle.

3,732,112

INTERMEDIATE MOISTURE FOOD COMPOSITIONS CONTAINING ALIPHATIC 1,3-DIOLS

John W. Frankenfeld, Atlantic Highlands, N.J., and Marcus Karel, Newtonville, and Theodore P. Labuza, North Tewksbury, Mass., assignors to Esso Research and Engineering Company

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,135

Int. Cl. A23l *3/34*

U.S. Cl. 99—150 R 19 Claims

Intermediate moisture food compositions are prepared utilizing as an ingredient linear aliphatic 1,3-diols having 4 to 15 carbon atoms in the chain and their esters for the inhibition of bacterial, yeast and mold growth.

3,732,113

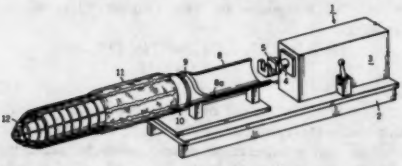
METHOD AND APPARATUS FOR PREPARING A POULTRY PRODUCT

Roger E. Walters, Glendale, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Feb. 12, 1971, Ser. No. 115,028

Int. Cl. B65b *25/06*

U.S. Cl. 99—174 7 Claims



A poultry roll which is fabricated by surrounding poultry meat with an artificial skin may be assembled and tied together in a single operation. A scoop unit having a shape conforming to a portion of the desired configuration of the poultry roll is utilized. An artificial or fabricated skin is placed within the scoop unit, pieces of poultry meat are layered on the artificial skin, and the artificial skin is folded over the layered poultry meat to substantially surround the poultry meat. The scoop unit containing the poultry meat roll is then connected to a ram which is effective to insert the scoop unit and poultry meat roll through an arbor having a prestretched net material thereon. The net material grippingly engages the poultry roll while releasably engaging the scoop unit, and thereafter the ram retracts the scoop unit from the arbor allowing the meat roll to be retained within the net material.

3,732,114

LAMINATED FROZEN FOOD PRODUCT

Crosby Field, deceased, late of Brooklyn, N.Y., by Dorothy H. Hole, Charles H. Berg and Margaret R. Norbeck, executors of the Estate of said Crosby Field

Division of Ser. No. 734,126, June 3, 1968, Pat. No. 3,528,257. This application June 29, 1970, Ser. No. 60,175

Int. Cl. A23b *7/04*; F25c *5/06, 7/12*

U.S. Cl. 99—192 3 Claims

A method and apparatus for extremely rapid freezing and the product it produces. Thin layers of product are frozen and subcooled on a flexible strip in consecutive layers. The product is then removed from the strip and processed.

3,732,115

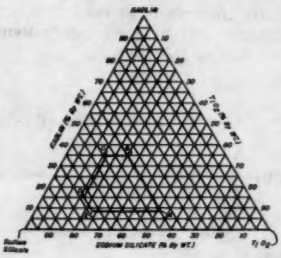
SILICIOUS COMPOSITION FOR MARKING HOT METAL AND METHOD OF MAKING AND USING SAME

David R. Lankard, Granview Heights, and Herbert D. Sheets, Jr., Columbus, Ohio, assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 840,225, July 9, 1969, which is a continuation-in-part of abandoned application Ser. No. 612,783, Jan. 31, 1967. This application Aug. 30, 1971, Ser. No. 176,051

Int. Cl. C09d *1/02, 11/00, 13/00*

U.S. Cl. 106—19 2 Claims



A liquid composition for marking metal products while at high temperature, by jet-spray application, comprises a pigment of metal oxide, such as titanium dioxide, in a vehicle of sodium-silicate solution containing kaolin as a suspending agent. A method of making such composition is also disclosed.

3,732,116

GLASS-CERAMIC ARTICLES CONTAINING STRONTIA-, YTTRIA-, LANTHANA-, AND/OR TANTALA-BEARING CRYSTAL SPECIES

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Oct. 21, 1970, Ser. No. 82,844
Int. Cl. C03c 3/22
U.S. Cl. 196—39.7 1 Claim

This invention relates to the production of glass-ceramic articles exhibiting very low coefficients of thermal expansion and excellent resistance to creep at temperatures up to 1000° C. More specifically, this invention is concerned with glass-ceramic articles containing beta-spodumene solid solution as the principal crystal phase which are crystallized in situ from glass compositions in the Li_2O-Al_2O_3-SiO_2 field but which also contain minor, but necessary, amounts of SrO, Y_2O_3, La_2O_3, and/or Ta_2O_5.

3,732,117

DIELECTRIC CERAMIC COMPOSITION COMPRISING LEAD-LANTHANUM TITANATE SOLID SOLUTION

Tsuneharu Nitta; Hiromitsu Taki, both of Osaka, and Kaneomi Nagase, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed March 24, 1971, Ser. No. 127,836
Claims priority, application Japan, April 2, 1970, 45/28414; May 19, 1970, 45/43182; June 9, 1970, 45/50068
Int. Cl. C04b 33/00
U.S. Cl. 106—73.2 7 Claims

Dielectric ceramic having a high dielectric constant and a low dielectric loss over a wide frequency range of 1 kHz to 30 MHz, a small temperature coefficient of dielectric constant, high stability with time, a high breakdown voltage and high mechanical strength is a sintered mixture composed essentially of 65 to 96 percent by weight of $BaTiO_3$, 3 to 20 percent by weight of $[Pb_{1-x}La_{2x(1-y)}Ti_{1+xy-x}O_{3-xy}]$ (where x is a 0.15 to 0.8 mole and y is 0.5 to 0.9 mole), 1 to 15 percent by weight of $BaZrO_3$, and/or, as additives, up to 10 percent by weight of at least one additive selected from the group consisting of Bi_2O_3, $Bi_2(TiO_3b$-3, $Bi_2(SnO_5)$, $Bi_2(ZrO_3)$ and SiO_2.

3,732,118

CHEMICAL PROCESS

Robert Langley, Newton Mearns, and Robert Bruce McKay, Kilmarnock, Scotland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,435
Int. Cl. C08h 17/14
U.S. Cl. 106—309 14 Claims

Flocculation resistant pigments are prepared by milling together a phthalocyanine pigment and a minor portion of a chloromethylated phthalocyanine pigment and a reactive polyamide.

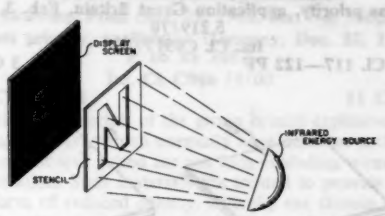
3,732,119

TEMPERATURE SENSITIVE VISUAL DISPLAY DEVICE

Donald Churchill, James V. Cartmell, and Robert E. Miller, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Application Feb. 27, 1967, Ser. No. 618,751, now abandoned, which is a continuation-in-part of application Ser. No. 558,354, June 17, 1966. Divided and this application Nov. 5, 1968, Ser. No. 798,237
Int. Cl. B41m 5/18
U.S. Cl. 117—1.7 4 Claims

A temperature-responsive display device or composition, comprising mesomorphic ("liquid crystal") material(s) contained in minute capsules as the temperature-responsive component, is provided. The minute capsules, when placed in heat-conductive relation with a heat source together with an associated thermal gradient pattern to be displayed, exhibit an iridescence indicative of a certain characteristic temperature range, which temperature range varies according to the types and mixtures of mesomorpholic materials employed. Encapsulation of the mesomorphic materials affords physical and chemical protection from various kinds of degradation and allows their use in practical and efficient thermal-gradient display systems.

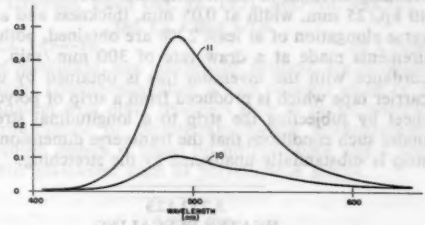


3,732,120

PRESSURE-SENSITIVE RECORDING SHEET

Bruce W. Brockett and Robert E. Miller, Dayton, and Mary L. Hinkle, Middletown, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed June 14, 1971, Ser. No. 152,830
Int. Cl. B41m 5/16
U.S. Cl. 117—16 14 Claims



Sensitized record sheet material, suitable for developing useful color in oily, colorless, chromogenic dye-precursor inks applied thereto. Said record sheet material has a coating comprising an oil-soluble metal salt of a phenol-formaldehyde novolak resin.

ERRATUM

For Class 117—36 see:
Patent No. 3,732,141

3,732,121

GLOSS FORMING PROCESS

Ronald W. Long, Florissant, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned applications Ser. No. 822,018 and Ser. No. 822,026, both May 5, 1969. This application Feb. 13, 1970, Ser. No. 11,339
Int. Cl. B44d 1/44; C09d 3/02; D21h 1/34
U.S. Cl. 117—65.2 10 Claims

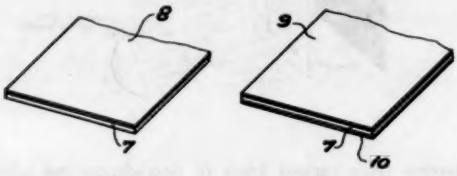
A process for increasing the gloss of paper coating compositions containing protein binders is disclosed. The process involves adding a high gloss inducing material to a bound coating composition, coating a paperboard stock with the coating composition, and calendering the coated paperboard to a gloss which is substantially higher than coated paperboard which is not treated with the high gloss inducing material. Additionally, a gloss inducing solution may be sprayed on the coating before calendering or the gloss inducing solution may be used separately.

3,732,122

PRESSURE-SENSITIVE ADHESIVE TAPE

Vagn Christian Albert Fehrn-Christensen, Fridbach 2, Zug, Switzerland

Filed Jan. 25, 1971, Ser. No. 109,542
Claims priority, application Great Britain, Feb. 3, 1970, 5,219/70
Int. Cl. C09j 7/02
U.S. Cl. 117—122 PF **3 Claims**



In the manufacture of pressure-sensitive adhesive tape a carrier tape consisting of a plastic material is normally used, such carrier tape being covered at least one side with a suitable adhesive layer. The carrier tape is normally made of a sheet with a thickness of 0.04 mm. with a tensile breaking strength of from 12 to 15 kp. at a width of 25 mm. measured at a draw rate of 300 mm. per minute. The purpose of the present invention is to provide a pressure-sensitive adhesive tape having a tensile breaking strength in the longitudinal direction of at least 40 kp./25 mm. width at 0.05 mm. thickness and a transverse elongation of at least 20% are obtained, both measurements made at a draw rate of 300 mm./min. In accordance with the invention this is obtained by using a carrier tape which is produced from a strip of polyolefinic sheet by subjecting the strip to a longitudinal stretching under such conditions that the transverse dimension of the strip is substantially unaffected by the stretching.

3,732,123

HEATER DESCALING

Frank Stolfa, Park Ridge; Laurence O. Stine, Western Springs; James R. Deering, Prospect Heights, and Douglas G. Linden, Hoffman Estates, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 21, 1970, Ser. No. 100,507
Int. Cl. B08b 7/04, 9/06; C10g 9/16
U.S. Cl. 134—19 **10 Claims**

The descaling of heater tubes is effected by alternately subjecting the deposited scale to oxidation and reduction techniques. Oxidation is preferably effected in a vaporous atmosphere of 1.0 to 15.9 percent oxygen, and reduction in an atmosphere of 5.0 to 50.0 percent hydrogen. The heater is flushed, after either the reduction step, or after both oxidation and reduction, with steam and/or nitrogen to remove loosened particles of scale.

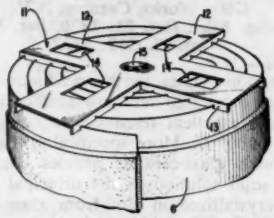
3,732,124

ELECTROCHEMICAL CELLS COMPRISING CURRENT COLLECTOR MEMBER EMBEDDED INTO THE PROTRUDING EDGES OF THE ELECTRODES

Jean-Pierre Cailley, Ambares, France, assignor to Societe des Accumulateurs Fixes et de Traction (Societe Anonyme) Romainville, France

Filed June 28, 1971, Ser. No. 157,163
Claims priority, application France, July 1, 1970, 24,413
Int. Cl. H01m 35/32
U.S. Cl. 136—13 **8 Claims**

Electrochemical cells involving an assembly of opposite polarity electrodes having bared carrier portions projecting respectively at opposite ends of the assembly with current collectors welded respectively at opposite ends of the assembly to the bared projecting carrier portions of the electrodes with accompanying embedment effected



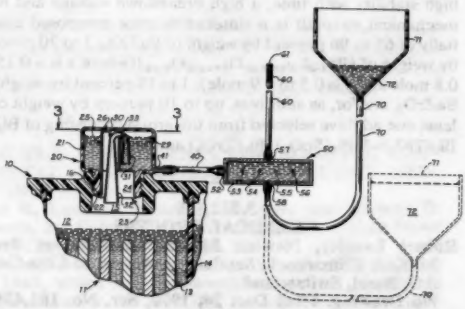
during welding under pressure of said bared portions into projections provided on the current collectors.

3,732,125

FILLING DEVICE FOR USE WITH LIQUIDS

Emerson L. Stroh, 3356 N. Gladstone Ave., Indianapolis, Ind. 46218

Filed Oct. 12, 1971, Ser. No. 188,021
Int. Cl. H01m 7/00; G01f 23/00
U.S. Cl. 136—162 **12 Claims**



A device is disclosed which is suitable for use in adding distilled water to storage batteries. The device incorporates a siphon to add water to the battery and is designed such that water is added only if the electrolyte level is below a predetermined level.

3,732,126

TREATMENT OF METALS

Harold Ralph William Cobb, Didcot, and Eric Brown, Wantage, England, assignors to United Kingdom Atomic Energy Authority, London, England

No Drawing. Continuation of application Ser. No. 649,454, June 28, 1967. This application July 20, 1970, Ser. No. 64,021
Claims priority, application Great Britain, June 30, 1966, 29,538/66
Int. Cl. C21d 7/02, 9/08; C22f 1/00
U.S. Cl. 148—11.5 R **9 Claims**

A method of treating metals which comprises working a metal to produce a varying amount of strain hardening throughout the cross section of metal and heat treating the metal to give a fine grain size at a surface of the metal and a coarser grain size in the interior of the metal.

3,732,127

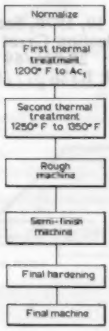
METHOD OF HEAT PROCESSING ALLOY STEEL TO OBTAIN MAXIMUM SOFTNESS AND UNIFORMITY

Roland W. Furgason, South Milwaukee, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Jan. 2, 1970, Ser. No. 156

Int. Cl. C21d *1/18*

U.S. Cl. 148—12.4 16 Claims



A method of thermally processing ultra high strength steel to obtain maximum softness and uniformity to increase its response to machining or other processing without adversely affecting its ability to respond to the final thermal treatment required to meet the final mechanical properties. The steel is subjected to a double thermal process in which the steel is initially given a thermal treatment at a temperature above 1200° F. and below the recognized lower critical on heating, cooled to below the martensitic finish temperature, and then reheated to a temperature in the range of 1250° F. to 1350° F. During the initial treatment the steel is maintained at temperature for a period of time sufficient to allow small areas of the steel to transform to austenite and cause the remaining carbides to spheroidize and upon cooling produces a microstructure which exhibits a partially spheroidized structure with small areas of fresh martensite uniformly dispersed throughout. The second thermal treatment causes the fresh martensite to spheroidize into carbides to provide a microstructure and low hardness level which is more responsive to further processing, as well as improved uniformity in hardness throughout the part and from part-to-part.

3,732,128

HEAT TREATMENTS OF DIE CASTINGS UNDER PRESSURE

Charles D. Statham, Trenton, N.J., assignor to N L Industries, Inc., New York, N.Y.

No Drawing. Filed July 16, 1971, Ser. No. 163,480

Int. Cl. C22f *1/04, 1/06*

U.S. Cl. 148—159 3 Claims

Metallic die castings of magnesium, aluminum and alloys thereof are subjected to a heat treatment of from 300° to 600° C. under a pressure of from 100 to 10,000 p.s.i. followed by a low temperature aging treatment to improve the properties of the metals without forming blisters on the die cast product.

3,732,129

EXPLOSIVE CHARGES INITIATED BY EXPLODING WIRES

Gerhard Martin, Troisdorf, Germany, assignor to Dynamit Nobel Aktiengesellschaft

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,202

Claims priority, application Germany, Dec. 22, 1967, P 16 46 348.2

Int. Cl. C06b *19/00*

U.S. Cl. 149—2 11 Claims

Explosive materials of the group brisant explosives and priming powders, which normally have densities such that they are not well suited for use with exploding wires used for initiation. Such materials are treated to provide them in a form of reduced density, whereby use therein of exploding wires is accommodated. The explosive material in the form of small particles is molded to form a body thereof, with the aid of a binder, to provide the material with a density of about 30–65% of the average crystal density of the explosive material. The exploding wire is embedded in the molded body, and, the ignition energy of the exploding wire is about 0.1–120 joules.

3,732,130

GUN PROPELLANT CONTAINING NONENERGETIC PLASTICIZER, NITROCELLULOSE AND TRIAMINOGUANIDINE NITRATE

Joseph E. Flanagan, Woodland Hills, and Vernon E. Haury, Santa Susana, Calif., assignors to North American Rockwell Corporation

No Drawing. Filed Oct. 14, 1971, Ser. No. 192,717

Int. Cl. C06d *5/06*

U.S. Cl. 149—18 10 Claims

Non-metallized gun propellant systems are provided containing triaminoguanidine nitrate oxidizer alone or in combination with other oxidizers such as cyclotrimethylene trinitramine or cyclotetramethylene tetranitramine. The binder system is based on nitrocellulose and a nonenergetic plasticizer such as polyethylene glycol.

3,732,131

GUN PROPELLANT CONTAINING NITROPLASTICIZED NITROCELLULOSE AND TRIAMINOGUANIDINE NITRATE

Vernon E. Haury, Santa Susana, and Milton B. Frankel, Tarzana, Calif., assignors to North American Rockwell Corporation

No Drawing. Filed Oct. 14, 1971, Ser. No. 192,718

Int. Cl. C06d *5/06*

U.S. Cl. 149—18 9 Claims

Non-metallized gun propellant systems are provided containing triaminoguanidine nitrate oxidizer alone or in combination with other oxidizers such as cyclotrimethylene trinitramine or cyclotetramethylene tetranitramine. The binder system is based on nitrocellulose and is typically a highly nitroplasticized nitrocellulose binder system.

3,732,132

EXTRUDABLE FLUOROCARBON PROPELLANTS

Raymond T. Merrow, Ridgecrest, Calif., Elmo C. Julian, Cincinnati, Ohio, Judson B. Eldridge, China Lake, Calif., George B. Rice, Trout Creek, Utah, and Robert L. Dow, China Lake, Charley R. Rodgers, Ridgecrest, and Bertram O. Stull, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Nov. 23, 1964, Ser. No. 413,680

Int. Cl. C06d *5/06*

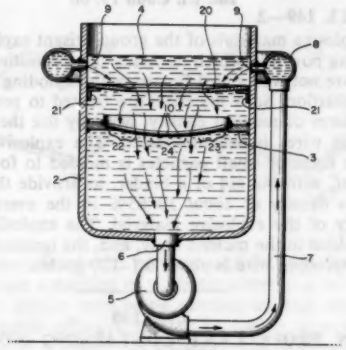
U.S. Cl. 149—19 7 Claims

Propellant compositions are prepared containing metals, oxidizing agents and a copolymer of vinylidene fluoride and perfluoropropylene with polytetrafluoroethylene.

3,732,133
RE-ETCH METHOD

James W. Schwartz, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 2, 1971, Ser. No. 168,223
Int. Cl. C23f 17/00
U.S. Cl. 156—6 2 Claims

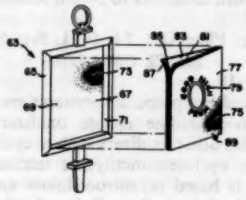


A process for re-etching the apertures of a color cathode-ray tube shadow mask to increase the diameter of each aperture by an amount dependent upon its spacing from the center of the mask by flowing a fluid etchant through the mask apertures and controlling the velocity of etchant flow through the apertures to differ from aperture to aperture as a function of the spacing.

3,732,134
JEWELRY PIECE AND METHOD

John Graham Michael, c/o Brown Wholesale Company, 2095 North 63rd Street, Philadelphia, Pa.

Division of Ser. No. 764,548, Oct. 2, 1968, Pat. No. 3,599,359.
This application April 27, 1971, Ser. No. 137,868
Int. Cl. B44c 1/24
U.S. Cl. 156—58 10 Claims



A jewelry piece comprising a jewelry body member, a bezel channel formed in the body member, and a sign plate mounted in the bezel channel, said sign plate including a developed photographic film with intelligence thereon, and a reflecting backing on the film, said sign plate being beveled.

A method for making a series of sign plates of the same design for jewelry pieces, comprising photographing art work on a series of frames of film having sprocket holes so that the art work on each frame is registered with respect to the sprocket holes, developing the film to obtain a roll of film frames, affixing a reflecting backing to the developed film, positioning each film frame precisely beneath a stamping die by using the sprocket holes, stamping out the sign plates, affixing the sign plates to a jewelry piece body, and beveling the sign plate.

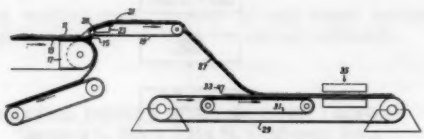
A sign plate comprising a developed photographic film with intelligence thereon, and a reflecting backing on the developed film.

A method of making a sign plate comprising photographing art work on film, developing the film to obtain a developed film with intelligence thereon, and affixing a reflecting backing to the film.

3,732,135
TEXTILE PROCESS

Ian Thomas Ernst, Killara, New South Wales, Australia, and Louis Richard Mizell, Andover, Mass., assignors to I.W.S. Nominee Company Limited, London, England

Filed Apr. 10, 1970, Ser. No. 27,386
Claims priority, application Great Britain, Apr. 18, 1969, 20,036/69
Int. Cl. B32b 31/18, 33/00
U.S. Cl. 156—72 10 Claims

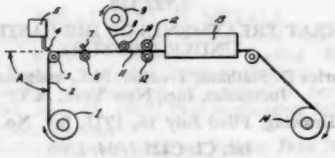


The invention disclosed relates to the production of pile fabrics from sliver knit fabrics. The process consists essentially of cutting a layer of pile fibres from the sliver knit fabric, transferring the layer of fibres to a layer of adhesive and pressing the fibre ends into contact with the adhesive at an elevated temperature. The heat and pressure are preferably applied simultaneously to the assembly of pile fibres and adhesive, for example by a heated flat press or heated rolls. The adhesive layer may be carried on a release surface, from which it may be stripped as a coherent film after the pile fibres have been bonded to it, or it may be formed on a permanent backing sheet, or indeed it may be formed in situ on the fibre ends themselves. A backing sheet may be bonded to the adhesive layer after the fibres have been bonded to it. The process yields pile fabrics which can be used in many applications, for example in the clothing or shoe industries or in paint rollers.

3,732,136
PROCESS AND APPARATUS FOR BACKING TUFTED CARPET

Donald S. Lord, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 17, 1971, Ser. No. 125,317
Int. Cl. B32b 31/16; D05c 15/00
U.S. Cl. 156—72 12 Claims



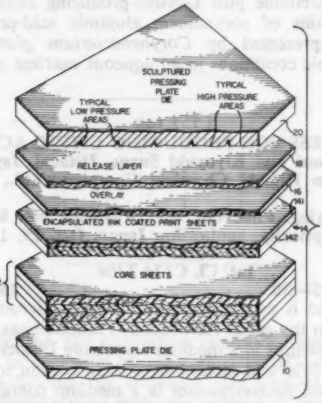
In applying backing and adhesive to tufted carpets, improved bundle wrap and bundle penetration of the tufts by the adhesive is obtained by applying the action of one or more vibrating or reciprocating blades to the back of the tufted carpet at a point between where the adhesive is applied and where the backing material is applied.

3,732,137

PREPARATION OF HIGH PRESSURE DECORATIVE LAMINATES HAVING REGISTERED COLOR AND EMBOSSING USING ENCAPSULATED INK

Herbert I. Scher and Israel S. Ungar, Randallstown, and John E. McQuade, Jr., Baltimore, Md., assignors to Esso Research and Engineering Company

Filed Oct. 26, 1970, Ser. No. 84,080
Int. Cl. B32b *3/00*; B44c *1/24*
U.S. Cl. 161—2 5 Claims



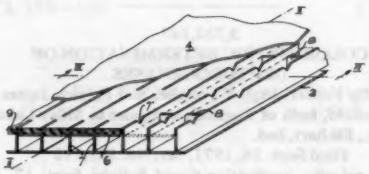
In the manufacture of high pressure decorative laminates having embossed surfaces with registration of color and texture, a melamine impregnated paper, coated with encapsulated ink, is used in place of the conventional decorative sheet below the overlay sheet. A sculptured plate is used having high pressure areas and low pressure areas, the encapsulated ink surface being separated from the sculptured plate by the overlay and a release layer. The resulting laminate after pressing has color developed by the rupture of the microcapsules and release of the ink contained therein at areas corresponding to high pressures due to the presence of and shape of the sculptured plate, whereas in the areas of lower pressure the microcapsules remain unruptured.

3,732,138

PANEL CONSTRUCTIONS

Ehud Almog, 13 Yegia Kapaim Street, Ramat Hasharon, Israel

Filed March 31, 1971, Ser. No. 129,683
Int. Cl. B32b *3/12, 1/06*
U.S. Cl. 161—43 12 Claims



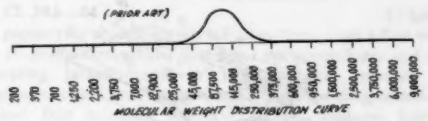
A panel characterized in that at least one of its external faces, i.e., the one under compression stresses when the panel is loaded, is made of a lamination including an outer layer bonded to an inner layer by an intermediate layer of rigid plastic foam. The thickness of the rigid plastic foam layer is many times the thickness of each of the said outer and inner layers, and the thickness of the complete panel is many times the thickness of the lamination. The panel further includes strengthening ribs extending longitudinally between the lamination and the other external face of the panel.

3,732,139

ABSORBENT FIBROUS NONWOVEN FABRIC AND METHOD OF FORMING THE SAME

Michael R. Fechillas, New Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 3, 1971, Ser. No. 195,373
Int. Cl. B32b *5/00*
U.S. Cl. 161—170 8 Claims



Synthetic resin binder compositions for bonding nonwoven fabrics, methods of using the same, and the resulting bonded nonwoven fabrics, wherein the synthetic resin binder compositions comprise from about 10 percent to about 50 percent by weight of a polymodal molecular weight distribution synthetic acrylic ester resin in which (1) one mode or peak is present in the molecular weight range of from about 300 to about 2,000 and another mode or peak is present in the molecular weight range of from about 4,000 to about 600,000 and (2) from about 10 percent to about 40 percent by weight has a molecular weight in the range of from about 300 to about 2,000 and from about 90 percent to about 60 percent by weight has a molecular weight in the range of from about 4,000 to about 600,000 said polymodal molecular weight distribution synthetic acrylic ester resin having a swell index in tetrahydrofuran of from about 50 to about 200, from about 50 percent to about 90 percent by weight of insolubles in tetrahydrofuran, and a second order glass transition temperature of from about −40° C to about +5° C.

3,732,140

METHOD FOR PRODUCING A FIBROUS BUNDLE WITH A TRACER AND PRODUCT THEREOF

Gerhard N. Bolen, Granville, Robert J. Gelin, Newark, and William N. Haggerty, Reynoldsburg, Ohio, assignors to Owens-Corning Fiberglas Corporation

No Drawing. Filed Oct. 15, 1970, Ser. No. 81,108
Int. Cl. D02g *3/18, 3/36*
U.S. Cl. 161—175 13 Claims

A method of producing a fibrous bundle having a tracer therein comprising advancing glass fiber strands through a bath comprising a colorant, drying the treated strands and combining the same with a plurality of sized glass strands.

3,732,141

PRESSURE-SENSITIVE RECORD MATERIAL

Bruce W. Brockett and Robert E. Miller, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Continuation-in-part of application Ser. No. 94,170, Dec. 1, 1970, which is a continuation-in-part of application Ser. No. 49,557, June 24, 1970, both now abandoned. This application Apr. 2, 1971, Ser. No. 130,831
Int. Cl. B41m *5/14, 5/16*
U.S. Cl. 117—36.8 24 Claims

Pressure-sensitive record material which involves the making of a vanadium-chelate print by pressure-release of droplets of a solution of an organic chelating agent in a hydrophobic liquid for color development by oil-insoluble vanadium salts. The print intensity, rate of print development, and resistance of the print to fading are optimized by addition to the print-developing coat of different combinations of calcium carbonate, silica gel and oil-soluble phenol-aldehyde resins.

3,732,142

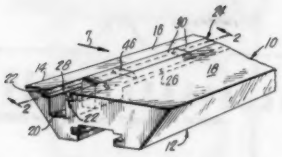
INSERT FOR PAPER MACHINE DRAINAGE ELEMENTS

Oliver J. Beacom, Montreal, Quebec, and Donald G. MacBean, Pierrefonds, Quebec, Canada, assignors to JWI Ltd., Montreal, Quebec, Canada

Filed Feb. 25, 1971, Ser. No. 118,767

Int. Cl. D21g *9/00*

U.S. Cl. 162—374 **4 Claims**



A replaceable drainage element having a wear resistant insert composed of a plurality of discrete elements arranged in end-to-end relationship and clamped in this relationship by a clamping member applying clamping pressure to the elements.

3,732,143

METHOD AND APPARATUS FOR DRILLING OFFSHORE WELLS

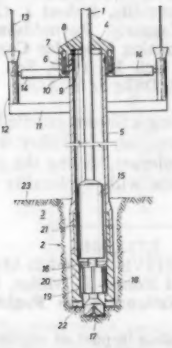
Cornelis G. Joosse, The Hague, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed May 20, 1971, Ser. No. 145,142

Claims priority, application Great Britain, June 17, 1970, 29,423/70

Int. Cl. E21b *43/01, 7/12*

U.S. Cl. 175—6 **15 Claims**



A method and apparatus for drilling offshore wells wherein a base unit and conductor string are lowered in the water by a drill string that is coupled to the conductor string, a rotatable shoe including cutting means being mounted on the lower end of the conductor string. A self-contained drilling unit is disposed in the conductor string below the coupling between the conductor string and drillstring, the drilling unit being used to drive the rotatable shoe to install the conductor string. After the conductor string is installed the drill string and self-contained drilling unit are withdrawn and the conductor string and base unit cemented in place.

3,732,144

PROCESS FOR PRODUCING L-THREONINE AND L-LYSINE

Kiyoshi Nakayama, Sagamihara, and Hiroshi Kase, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Jan. 18, 1971, Ser. No. 107,554

Claims priority, application Japan, Jan. 22, 1970, 45/5,390

Int. Cl. C12d *13/06*

U.S. Cl. 195—29 **9 Claims**

A process for producing L-threonine and L-lysine simultaneously by fermentation which comprises culturing an L-threonine plus L-lysine-producing certain type mutant strains of coryneform glutamic acid-producing bacteria represented by *Corynebacterium glutamicum* under aerobic conditions in an aqueous nutrient medium.

3,732,145

PROCESS FOR PRODUCING CITRIC ACID

Isoshi Oomori and Kiyoyuki Suzue, Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

No Drawing. Filed Oct. 28, 1970, Ser. No. 84,942

Claims priority, application Japan, Oct. 29, 1969, 44/85,992

Int. Cl. C12d *1/04*

U.S. Cl. 195—30 **18 Claims**

Citric acid is produced by culturing a microorganism belonging to the genus Aerobacter, Pseudomonas, Micrococcus or Bacillus in a medium containing L-isocitric acid and/or isocitric acid lactone as a main carbon source or culturing said microorganism in a medium containing L-isocitric acid or carbohydrate or both these materials, separating cells from the medium, adding them to an aqueous solution containing L-isocitric acid and/or isocitric acid lactone, converting said acid or lactone to citric acid by incubation, and recovering the resulting citric acid.

3,732,146

PROCESS FOR THE ISOLATION OF NATIVE, HIGHLY PURIFIED PLASMINOGEN

Norbert Heimburger, Marbach near Marburg/Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg/Lahn, Germany

Filed Dec. 22, 1970, Ser. No. 100,821

Int. Cl. C07g *7/02*

U.S. Cl. 195—66 B **11 Claims**

Method for isolating native plasminogen in highly purified form from plasma or serum by contacting the plasminogen-containing material with a water-insoluble carrier containing an ε-amino carboxylic acid and then eluting the carrier to recover plasminogen bound thereto.

3,732,147

COLORIMETRIC DETERMINATION OF DEHYDROGENASES

Alan Phillip Fosker, High Wycombe, and Patrick James Mill, Beaconsfield, both of England, assignors to Miles Laboratories Inc., Elkhart, Ind.

Filed Sept. 16, 1971, Ser. No. 181,192

Claims priority, application Great Britain, Sept. 17, 1970, 44,498/70

Int. Cl. G01n *31/14*

U.S. Cl. 195—103.5 R **8 Claims**

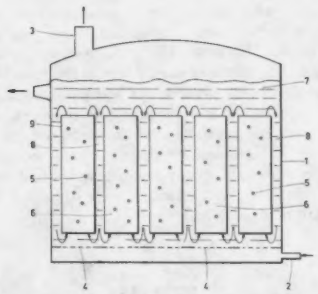
Test composition and method for assaying dehydrogenase enzymes in test fluids which comprises contacting the fluid with a test reagent comprising a coenzyme, a substrate for the dehydrogenase enzyme, a terminal acceptor dye and Meldola's Blue as an intermediary hydrogen carrier. A preferable embodiment of the present invention comprises incorporating the test composition with a solid carrier therefor and using the same as a dip and read test device.

3,732,148

INDUSTRIAL PROCESS AND APPARATUS FOR CULTIVATING MICROORGANISMS

Sigismond Franckowiak, Montesson, Pierre Trambouze, Versailles, and Hugo Van Landeghem, Vienne, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, Hauts de Seine, France

Filed Dec. 10, 1969, Ser. No. 883,881
Claims priority, application France, Dec. 11, 1968, 177,774; July 7, 1969, 6923039
Int. Cl. C12b *1/14*
U.S. Cl. 195—109 6 Claims



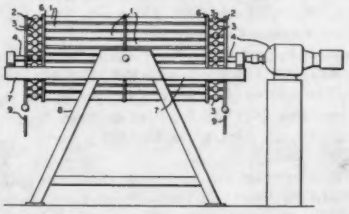
For aerating and cultivating microorganisms, there is provided an enclosure having a plurality of vertical partitions sub-dividing the enclosure into vertical elongated zones communicating with one another at their top and at their base. One group of the zones is fed with air at the base so as to carry the liquid phase of culture upwardly into a zone common to said group at the top where the air is at least partially separated from the liquid phase. Another group of the zones is not fed with air, but instead is used for the downward flow of the liquid phase, thereby obtaining continual circulation of the culture. At least some of the vertical partitions are hollow and provided with means for passing cooling liquid therethrough, the ratio between the total surface of the hollow partitions and the total volume of the vertical elongated zones delimited thereby being between 0.1 and 10 sq. meters per cubic meter, preferably between 0.5 and 2 sq. meters per cubic meter.

3,732,149

APPARATUS FOR THE LARGE SCALE GROWTH OF LIVING CELLS

Giovanni Santero, Milan, Italy, assignor to Societa Farmaceutici Italia (Farmitalia), Milan, Italy

Filed Sept. 16, 1970, Ser. No. 40,354
Int. Cl. C12b *1/00*
U.S. Cl. 195—139 5 Claims



Apparatus for growing cell cultures wherein a plurality of uniform columns in which cell cultures can grow are clamped together at the ends with manifolds which are fixed onto a shaft parallel to the columns so that the columns may be rotated about the shaft; the clamped columns also fixed to a support frame and there are means provided for rotating the shaft about a horizontal axis and for rotating the support frame about a vertical plane.

3,732,150

PROCESS FOR SEPARATING HALOGENATED HYDROCARBONS BY AZEOTROPIC DISTILLATION WITH AMMONIA

Grant C. Bailey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 22, 1971, Ser. No. 191,904
Int. Cl. C07c *19/08*; B01d *3/36*
U.S. Cl. 203—44 4 Claims

A process for separating pentafluoroethane from a first mixture of pentafluoroethane and 1,1,1-trifluoroethane and for separating tetrafluoroethane from a first mixture of tetrafluoroethane and 1,1-difluoroethane by adding ammonia to said first mixtures to form second mixtures having azeotropes and distilling the second mixtures in azeotropic distillation zones.

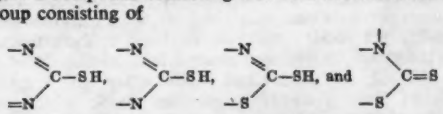
3,732,151

COPPER PLATING

Charles N. Abbott, Dayton, Ohio, assignor to Dayton Bright Copper Company, Dayton, Ohio

No Drawing. Continuation-in-part of application Ser. No. 679,971, Nov. 2, 1967. This application Apr. 27, 1970, Ser. No. 32,409
The portion of the term of the patent subsequent to Mar. 12, 1985, has been disclaimed
Int. Cl. C23b *5/20*, *5/46*
U.S. Cl. 204—52 R 6 Claims

The present invention relates to improved extender compositions used in copper electroplating comprising a mixture of a sulfurized sulfonated aromatic or hydroaromatic hydrocarbon, or substitution product thereof; an amino derivative of a triarylmethane; and as a leveling agent a compound containing a radical selected from the group consisting of



The combination of the three types of ingredients gives an additive composition of a synergistic character when used in copper plating in the form of improved brightness and leveling over a wider range of current density than previous additive compositions, and are particularly improved with respect to leveling.

3,732,152

ANODIZED MAGNESIUM AND MAGNESIUM ALLOYS

David L. Hawke, Metuchen, N.J., assignor to N L Industries, Inc., New York, N.Y.

No Drawing. Filed July 13, 1971, Ser. No. 162,316
Int. Cl. C23b *9/06*
U.S. Cl. 204—56 M 2 Claims

Magnesium metal or magnesium alloys are anodized by immersing in an aqueous bath containing sodium hydroxide and sodium hexafluorotitanate and passing an alternating current through the bath.

3,732,153

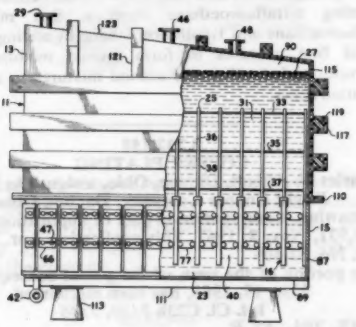
ELECTROCHEMICAL APPARATUS AND PROCESS FOR THE MANUFACTURE OF HALATES

Cyril J. Harke, Burnaby, and John C. Parkinson, North Vancouver, British Columbia, Canada, and John E. Currey, Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 5, 1971, Ser. No. 186,749
Int. Cl. C01b *11/26*; B01k *3/00*, *3/04*
U.S. Cl. 204—95 20 Claims

An electrochemical apparatus for the manufacture of halates, e.g., sodium chlorate, includes an electrolytic cell

having monopolar dimensionally stable anodes held to and removable from the cell at a side thereof, and cathodes, ducts for conducting hypohalite and gaseous electrolysis products upwardly through the cell and baffled means for conducting the hypohalite downwardly to a bottom portion of the cell, from which it may be drawn off as chlorate, or recycled, the baffled means for returning the hypohalite and other electrolyte constituents downwardly being such that the hypohalite will be held for a long enough time so as to become substantially converted to chlorate. In preferred aspects of the invention, the dimensionally stable monopolar anodes are of platinum, platinum-iridium alloy or ruthenium oxide over a valve metal such as titanium, tantalum or niobium, internal cooling of the electrodes is provided, conductors are copper rods clad with titanium, which also serve to rigidify the anodes, the cell top is of a fiberglass-reinforced plastic, replenished electrolyte is continually added to the cell, the anodes and cathodes are held apart by spacing lines of electrolyte-resistant plastic, which may be fastened together around a pair of cathode surfaces, and at least two such electrochemical apparatuses are electrically joined by copper connectors of a construction which minimizes thermal expansion-contraction strains on the electrodes.



3,732,154

CATALYTIC HYDROFINISHING OF LUBE OIL PRODUCT OF SOLVENT EXTRACTION OF PETROLEUM DISTILLATE

Ivor W. Mills, Media; Merritt C. Kirk, Jr., Thornton, and Albert T. Olenzak, Media, all of Pa., assignors to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 812,516, Feb. 19, 1969, Pat. No. 3,619,414. This application Sept. 8, 1970, Ser. No. 70,590

Int. Cl. C10g *23/02, 41/00*

U.S. Cl. 208—87 **12 Claims**

Hydrofinished petroleum products, useful as lube oils, rubber oils, refrigerator oils, transformer oils, cable oils, ATF and friction drive transmission fluids, etc., can be produced by a process comprising (1) solvent extracting petroleum distillate stock to obtain a raffinate product and an extract product, and (2) contacting at least one of these products with hydrogen, in the presence of a catalyst comprising a hydrogenating component selected from the group consisting of sulfides and oxides of a combination of nickel and at least one Group VIB metal (Cr, Mo, W). Especially preferred metal combinations are (a) nickel and molybdenum, (b) nickel, molybdenum and at least one other iron group metal (e.g., Co) and (c) nickel and tungsten. The preferred petroleum distillate is naphthenic by viscosity-gravity constant classification.

3,732,155

TWO-STAGE HYDRODESULFURIZATION PROCESS WITH HYDROGEN ADDITION IN THE FIRST STAGE

Richard R. Cecil, and Thomas E. Fink, both of Baton Rouge, La., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed March 31, 1971, Ser. No. 129,946

Int. Cl. C10g *23/00*

U.S. Cl. 208—210 **18 Claims**

A process wherein sulfur-containing light or heavy hydrocarbon feeds are contacted with sulfur-resistant catalysts and desulfurized. The process involves a combination of steps, viz., an initial step wherein the feed is contacted with the catalyst in the presence of hydrogen and desulfurized, hydrogen, light ends and by-product hydrogen sulfide are separated from the partially desulfurized product and a subsequent step wherein said product is contacted with catalyst without the addition of any hydrogen to said step. Better hydrogen utilization and efficiency are obtained in the total desulfurization of the feed.

3,732,156

PRODUCTION OF LUBRICATING OILS

Robert Neil Bennett, Ashford, England, and Francis John Morum, West Cross, Wales, assignors to The British Petroleum Company Limited, London, England

No Drawing. Filed May 20, 1971, Ser. No. 145,492

Claims priority, application Great Britain, June 1, 1970, 26,307/70

Int. Cl. C10g *13/02, 37/10;* **C01b** *33/28*

U.S. Cl. 208—111 **7 Claims**

Lubricating oil of improved V.I. and also gasoline are produced by partial hydrocracking of a petroleum feedstock boiling above 350° C. at 300–400° C. and 6900–26,700 kN./m.²g. using a catalyst of a hydrogenating metal and a decationised faujasite-type zeolite. Less middle distillate is produced than when using non-zeolite catalysts. The use of a decationised faujasite is necessary, a magnesium faujasite catalyst giving no V.I. improvement.

The hydrogenating metal is preferably a platinum group metal and the preferred conversion is 40–95% wt. of product boiling below 350° C. Products, after dewaxing, of 85–125 V.I. can be produced from feedstocks of 60–80 V.I.

3,732,157

ELECTROLYTIC CELL INCLUDING TITANIUM HYDRIDE CATHODES AND NOBLE-METAL COATED TITANIUM HYDRIDE ANODES

Bernard J. Dewitt, Akron, Ohio, assignor to Nora International Company, Panama City, Panama

Continuation-in-part of Ser. No. 726,865, May 6, 1968, Pat. No. 3,617,462. This application Feb. 17, 1971, Ser. No. 115,992The portion of the term of this patent subsequent to Oct. 26, 1988, has been disclaimed.

Int. Cl. B01k *3/06*

U.S. Cl. 204—268 **12 Claims**

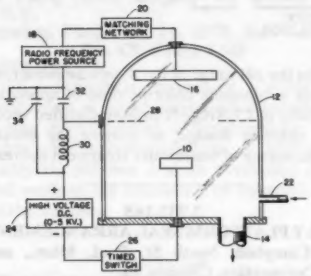
Electrolytic cells for the electrolysis of aqueous alkali metal chlorides are disclosed. Further disclosed are electrodes for use in combination with said cells, the said electrodes having titanium hydride cathodic members and noble metal coated titanium hydride anodic members. The noble metal coatings on the anodic members are gold, silver, platinum, palladium, iridium, ruthenium, osmium, and rhodium. In one exemplification, the electrolytic cell is of bipolar configuration and has a bipolar electrode of titanium hydride with a titanium hydride cathodic surface, and a noble metal anodic surface.

3,732,158

METHOD AND APPARATUS FOR SPUTTERING UTILIZING AN APERTURED ELECTRODE AND A PULSED SUBSTRATE BIAS

John S. Przybyszewski, North Olmsted, and Richard K. Shaltens, Lakewood, Ohio, assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Jan. 14, 1971, Ser. No. 106,424
Int. Cl. C23c 15/00
U.S. Cl. 204—192 7 Claims



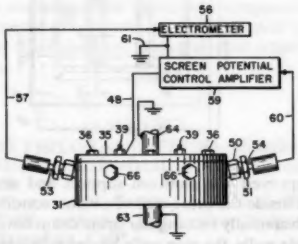
Combining the advantages of ion plating with the versatility of a radio frequency sputtered source. A pulsed high voltage direct current is passed to the article being plated during radio frequency sputtering.

3,732,159

FLOW-THROUGH CHAMBER FOR ANALYSIS OF CONTINUOUSLY FLOWING SAMPLE SOLUTION

David M. H. Platt, Hopkinton, Mass., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 17, 1970, Ser. No. 29,467
Int. Cl. G01n 27/26, 27/28
U.S. Cl. 204—195 R 12 Claims



Disclosed is a flow-through sample analyzing chamber in which the electrodes are symmetrically disposed with respect to the fluid inlet and outlet passages, and the chamber construction in such that the flow of fluid therein is symmetrical. A conductive screen may be disposed in the fluid flow path to provide a uniform electrical field in the vicinity of the electrodes and to trap bubbles, thereby preventing the passage thereof over the electrodes.

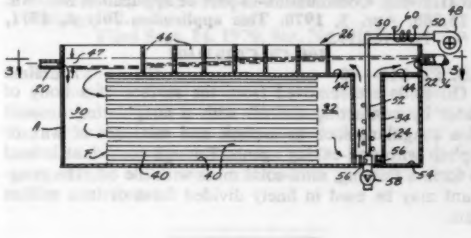
3,732,160

SUBMERGED FILTER-HORIZONTAL FLOW MODE

John W. Klock, Tempe, Ariz., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 754,341, Aug. 21, 1968, now Patent No. 3,563,888. This application Dec. 31, 1970, Ser. No. 103,271
Int. Cl. C02c 1/04
U.S. Cl. 210—14 21 Claims

Waste-containing liquor is biochemically treated in a tank or cell by continuously recirculating it through a filter media which is submerged in the liquor while continuously withdrawing a small portion of said liquor. A pressurized column of oxygen-containing gas entrains and lifts the liquid waste through an unobstructed tube and recirculates it horizontally through the filter media. During the lifting process oxygen from the fluid permeates the waste in order to ensure active aerobic metabolism.



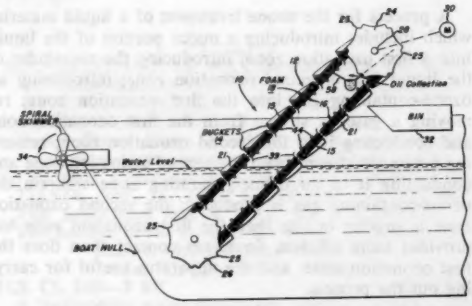
The tank may be arranged in series with other similar tanks utilizing horizontal flow through the filter media, or one or more of such tanks may be arranged in combination with one or more tanks having vertical flow through the filter media, as disclosed in my copending application, Ser. No. 754,341, filed Aug. 21, 1968. The influent may be either raw sewage or partially treated wastes.

3,732,161

METHOD FOR REMOVING OIL AND DEBRIS FROM WATER

James F. Grutsch, Hammond, and Russell C. Mallatt, Crown Point, Ind., assignors to Standard Oil Company, Chicago, Ill.

Original application Mar. 18, 1970, Ser. No. 20,508. Divided and this application Jan. 22, 1971, Ser. No. 108,939
Int. Cl. E02b 15/04
U.S. Cl. 210—30 4 Claims



Oil, solid particles such as biological slime and floating debris, etc., are removed from water by an apparatus including endless chain means made up of a series of interconnected foraminous chambers holding a regenerable porous filter material such as polyurethane. Preferably, the filter material has an outer large pore section and an inner small pore section. A plurality of buckets are attached to the chain means and, as the chain means moves through a closed loop path, these buckets catch debris and dump it into a holding bin. Simultaneously, the filter material absorbs surface and subsurface oil and the like from

water traveling through the filter material. The filter material is regenerated by squeezing the filter material to release the oil.

3,732,162
METHOD OF REMOVING OIL SPILLS FROM WATER

Frederic C. McCoy, Beacon, Howard V. Hess, Glenham, and Rodney L. Sung, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 25,588, Apr. 3, 1970. This application July 6, 1971, Ser. No. 160,193

Int. Cl. C02b *9/02*

U.S. Cl. 210—40 **7 Claims**

Oil spills are removed from the surface of a body of water by contacting the oil with a coagtlating amount of a coagulant such as asphalt and mixtures of wax or asphalt with anti-caking agents. Enough coagulant is used to form a floating, semi-solid mass with the oil. The coagulant may be used in finely divided form or in a molten state.

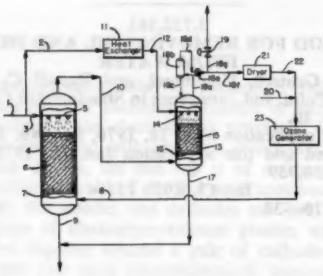
3,732,163
PROCESS AND APPARATUS FOR THE OZONE TREATMENT OF A LIQUID MATERIAL

Heine Lapidot, Latham, N.Y., assignor to General Electric Company

Filed Nov. 3, 1971, Ser. No. 195,390

Int. Cl. C02c *5/04*

U.S. Cl. 210—47 **17 Claims**



A process for the ozone treatment of a liquid material which includes introducing a major portion of the liquid into a first ozonation zone; introducing the remainder of the liquid into a second ozonation zone; introducing an ozone-containing gas into the first ozonation zone; removing a gaseous stream from the first ozonation zone and conducting it to the second ozonation zone; removing a gaseous stream from the second ozonation zone and conducting it to an ozone-generating zone wherein the ozone-containing gas is produced; the second ozonation zone is smaller in size than the first ozonation zone but provides more efficient liquid-gas contact than does the first ozonation zone; and the apparatus useful for carrying out the process.

3,732,164
NITROGEN REMOVAL FROM WASTE WATER BY BREAKPOINT CHLORINATION

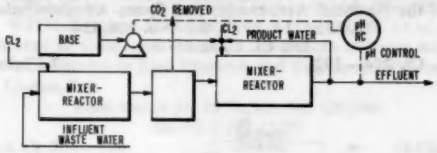
Thomas A. Pressley, Springfield, Va., and Dolloff F. Bishop, Jr., Camp Springs, Md., assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

Filed Aug. 30, 1971, Ser. No. 175,902

Int. Cl. C02b *1/36*

U.S. Cl. 210—60 **8 Claims**

Sodium hypochlorite or chlorine is used to oxidize the ammonia in raw, secondary and lime clarified municipal wastewaters. In systems with only ammonia as the chlorine demand, the breakpoint exhibits a minimum chlorine dose at approximately an 8:1 weight ratio of Cl:NH_3—N in the pH range of 6 – 7. End products at the breakpoint are N_2, NCl_3, and NO_3^-. Qualitatively, the formation of the N_2 is completed in less than



one minute in the pH range of 6 – 8. In wastewater, the breakpoint requires a minimum chlorine dose of approximately an 8:1 weight ratio of Cl:NH_3—N in lime clarified secondary effluent. The chlorine dosage, to achieve the breakpoint increases as the degree of wastewater treatment decreases.

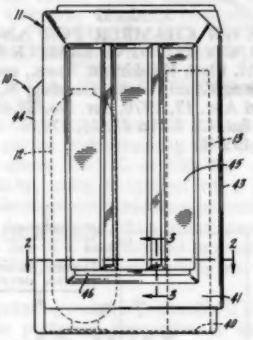
3,732,165
SALT PLATFORM SEAL ARRANGEMENT

Donald S. Campbell, North St. Paul, Minn., assignor to Ecodyne Corporation, Chicago, Ill.

Filed March 24, 1971, Ser. No. 127,479

Int. Cl. C01d *3/04*

U.S. Cl. 210—190 **2 Claims**



An improved salt platform support and seal arrangement mounted inside the brine well of a water conditioner, comprising: a substantially rectangular brine drum having a pair of apposing side walls, the side walls having substantially horizontal rib portions undercut therefrom extending a short distance into the drum; and a salt platform supported on the rib portions so as to overlap the rib portions a sufficient distance to permit sliding movement of the salt platform on the rib portions while preventing salt pellets from falling to the bottom of the brine drum.

3,732,166
PROCESS OF CLEANING WELLS WITH CARBON DISULFIDE EMULSIONS

Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application Dec. 17, 1969, Ser. No. 886,016, now Patent No. 3,700,594, dated Oct. 24, 1972. Divided and this application Sept. 15, 1971, Ser. No. 180,877

Int. Cl. E21b *43/00*

U.S. Cl. 166—304 **6 Claims**

Non-Newtonian formulations containing carbon disulfide (CS_2) of reduced toxicity and flammability. These formulations are illustrated by high internal phase ratio

(HIPR) emulsions containing carbon disulfide in the internal phase, said internal phase containing more than about 60% of the formulation by volume and preferably more than about 80% of the formulation by volume. These formulations are particularly useful in cleaning oil and gas wells by the removal of wax and/or sulfur.

3,732,167
MOTOR OIL COMPOSITION

Walter D. Foucher, Jr., Wappingers Falls, William R. Siegart, Poughkeepsie, and Herbert C. Morris, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,394
Int. Cl. C10m 1/48
U.S. Cl. 252—32.7 E 8 Claims

Motor oil composition comprising a mineral lubricating oil containing in combination an alkylated diphenylamine, a zinc dihydrocarbyl dithiophosphate, a hydroxyalkyl hydrocarbyl thiophosphonate, a nitrogen-containing methacrylate polymer and an overbased calcium sulfonate and method for operating an internal combustion reciprocating engine.

3,732,168
PROCESS AND COMPOSITION FOR THE PRODUCTION OF INSULATING SOLDERABLE COATINGS

Gerhard F. Ottmann; Hans-Ulrich Poth, both of Wuppertal-Elberfeld, Germany, and Horst Holfort, Mexico 20 DF, Mexico, assignors to Dr. Kurt Herberts & Co. vorm Otto Louis Herberts, Wuppertal-Barmen, Germany

Filed Nov. 9, 1970, Ser. No. 88,183
Claims priority, application Germany, Nov. 13, 1969, P 19 57 157.4
Int. Cl. B44d 1/42; H01b 3/18
U.S. Cl. 252—63.7 19 Claims

A process and composition for producing insulating solderable coatings on electrical conductors are disclosed wherein a solution containing a polyhydroxyl compound having a heterocyclic ring system and from 5 to 12 percent by weight hydroxyl groups, and a polyfunctional isocyanate is coated on the conductor and cured at a temperature above 250° C. The coated conductors are characterized by high resistance to heat and chemicals, as well as short soldering times in a solder bath.

3,732,169
POLY(ALKOXY)SILOXANE FLUID COMPOSITION CONTAINING A PHENOLIC CRYSTALLIZATION INHIBITOR

Merwyn L. Burrous, El Cerrito, and Neal W. Furby, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 860,051, Sept. 22, 1969. This application Jan. 31, 1972, Ser. No. 222,344
Int. Cl. C09k 3/00
U.S. Cl. 252—78 9 Claims

A functional fluid inhibited against crystallization which comprises a poly(alkoxy)siloxane base fluid, a bulk oxidation inhibitor, and a phenolic crystallization inhibitor. A rubber swelling agent may also be present.

3,732,170
BIO-SOAKING PERFORMANCES

Yvon Demangeon, Ermont, France, assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 75,716, Sept. 25, 1970. This application June 26, 1972, Ser. No. 266,261
Int. Cl. C11d 7/54
U.S. Cl. 252—95 4 Claims

Biological cleaning composition containing an enzyme and, as an oxidizing agent, an alkali-metal monopersulfate triple salt. Preferred enzymes are proteolytic subtilisin enzymes. A preferred monosulfate triple salt is

$$[2KHSO_5 \cdot KHSO_4 \cdot K_2SO_4]$$

3,732,171
COMPOSITION AND METHOD FOR IRON REMOVAL

Eugene J. Kuhajek, Woodstock, and Gordon H. Tibbitts, Hebron, Ill., assignors to Morton International, Inc., Chicago, Ill.

Filed Sept. 14, 1970, Ser. No. 71,854
Int. Cl. C11d 7/54
U.S. Cl. 252—105 13 Claims

A composition and method of removing iron ions from iron-coated or iron-fouled substances, more particularly for removing iron ions from iron-fouled ion exchange resins used in water-treating operations. The composition comprises an alkali metal hydrosulfite and an alkali metal sulfite contributor.

3,732,172
PROCESS FOR MAKING MINUTE CAPSULES AND PREFABRICATED SYSTEM USEFUL THEREIN

James A. Herbig and John F. Hanny, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Feb. 28, 1968, Ser. No. 708,792
Int. Cl. B01j 13/02; B44d 1/02
U.S. Cl. 252—316 10 Claims

A process is provided for producing minute capsules, en masse, wherein volatile solvent is evaporated from droplets of dissolved polymeric material dispersed in a liquid manufacturing vehicle immiscible with the volatile solvent which droplets have enwrapped dispersed capsule core entities. The process includes only evaporation of the solvent from the solution of polymeric material and requires no liquid-liquid phase separation. Practice of the novel process requires that important system components, namely, (a) manufacturing vehicle, (b) solution of polymeric capsule-wall forming material, and (c) intended capsule core entities be mutually immiscible, inert, and mobile. For example, the core material may be NH_4NO_3, the wall material may be nitrocellulose, the solvent may be methyl ethyl ketone, and the vehicle may be heptacosafluorotributylamine.

3,732,173
MANUFACTURE OF WATER-SOLUBLE CATIONIC NON-THERMOSETTING METHYLAMINE-EPICHLOROHYDRIN POLYMER AT CONSTANT TEMPERATURE

Daniel Elmer Nagy, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 778,934, Nov. 26, 1968, now Patent No. 3,567,659. This application Jan. 4, 1971, Ser. No. 103,836
The portion of the term of the patent subsequent to Mar. 2, 1988, has been disclaimed
Int. Cl. C08g 23/12, 43/00
U.S. Cl. 260—2 BP 5 Claims

A hydrophilic water-dispersible cationic storage stable methylamine-epichlorohydrin polymer is prepared by reacting 1 mol of methylamine with 0.8–1.2 mol of epichlorohydrin to produce a cationic and water-dispersible polymer and substantially completely reacting said polymer at a pH above 8 and temperature above 80° C. said polymer with successively small increments of epichlorohydrin until the polymer is close to being a gel. Preferably, the last increment is large enough to cause the solution to gel if completely reacted, and a monofunctional amine is added when the viscosity of the solution is just short of the gel point to arrest further progress of the reaction.

3,732,174

VULCANIZATION OF HALOGEN CONTAINING ELASTOMERS WITH THIOALKANOIC ACIDS AND THEIR SALTS AND UNCURED AND CURED PRODUCTS THEREOF

Paul P. Nicholas, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Feb. 7, 1972, Ser. No. 224,318
Int. Cl. C08g *23/06*
U.S. Cl. 260—2 A **13 Claims**

A new method for vulcanizing epihalohydrin elastomers employs, as essential vulcanization ingredients, (1) a thioalkanoic acid or its metal salts such as thiodipropionic acids, methylene-bis-thiopropionic acid, thiodiacetic acid and mercaptoacetic acid or the corresponding sodium or lead salts, and (2) a tertiary amine, particularly the compound 1,4-diaza(2.2.2)bicyclooctane. When the acid form of ingredient (1) is employed it is necessary to add a third component which is a metal base compound such as an alkali metal carboxylate, lead oxide, etc. When a metal salt of a thioalkanoic acid ingredient (1) such as disodium thiodipropionate is employed the third component is unnecessary. This vulcanizing system provides very fast and adjustable cure cycles producing vulcanizates of low odor and of excellent physical properties.

3,732,175

CROSSLINKING OF PHOSPHAZENE POLYMERS

Harry Rex Allcock, State College, Pa., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Sept. 27, 1971, Ser. No. 184,180
Int. Cl. C08g *33/16*
U.S. Cl. 260—2 P **5 Claims**

The crosslinking of poly(alkoxy- and aryloxy-)phosphazenes the skeletal chains of which consist of recurring units represented by the general formula

in which R and R′ each represents alkyl, fluoralkyl or aryl or other monovalent units, is accomplished by a ligand exchange process involving an alkali metal salt of a fluorinated polyol.

3,732,176

LOW RESILIENCY MICROCELLULAR POLYURETHANE ELASTOMER WITH INTEGRAL SKIN AND METHOD FOR PREPARATION THEREOF

Fritz Hostettler, Freehold, N.J., and George W. Huffman, Crystal Lake, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed Jan. 12, 1972, Ser. No. 217,280
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 AP **5 Claims**

This invention relates to a method for preparing certain microcellular elastomers having low resiliency and an integral skin which is substantially non-porous comprising contacting certain polyether glycols and ethylene oxide capped 4,4′-isopropylidenediphenol with methylene bis(4-phenylisocyanate) in the presence of a blowing agent and a catalyst system consisting of a tertiary amine and an organotin compound.

3,732,177

EXOTHERMIC INSULATING COMPOSITIONS COMPRISING GLASS POLISHING RESIDUE

Norman F. Tisdale, Jr., Valencia, and James F. McCarthy, Mars, Pa., assignors to The Union Commerce Bank, Cleveland, Ohio

No Drawing. Continuation-in-part of application Ser. No. 845,046, July 25, 1969. This application Mar. 27, 1970, Ser. No. 23,509
Int. Cl. B22c *1/22*; C04b *35/14*; C08g *51/04, 51/18*
U.S. Cl. 260—17.2 **10 Claims**

Exothermic insulating compound for use in the casting of metals comprising 50–82% finely divided refractory material comprising at least about 10% glass polishing residue, 0 to 72% sand, 0 to 20% silica flour, and 0 to 20% diatomaceous earth, 4–12% asbestos fiber, up to 12% cellulosic material, up to 12% reactive metal, up to 14% metal oxide, and 3–12% binder resin.

3,732,178

VINYL CHLORIDE EMULSION POLYMER AND COPOLYMER COMPOSITIONS

Ludwig Kuhnen, Marl, Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

No Drawing. Continuation-in-part of application Ser. No. 790,152, Jan. 9, 1969, now Patent No. 3,627,717, and abandoned applications Ser. No. 887,395, Dec. 22, 1969, and Ser. No. 20,015, Mar. 22, 1970. This application Sept. 27, 1971, Ser. No. 184,209
Claims priority, application Germany, Jan. 20, 1968, P 17 20 430.7; Apr. 18, 1968, P 17 70 223.7; Jan. 14, 1969, P 19 10 149.3; Apr. 11, 1969, P 19 18 414.6
The portion of the term of the patent subsequent to Dec. 14, 1988, has been disclaimed
Int. Cl. C08f *3/30, 29/18, 45/54*
U.S. Cl. 260—23 EM **11 Claims**

Vinyl chloride polymer and copolymer compositions are prepared by emulsion polymerization of vinyl chloride in the presence of sodium salt of α-sulfo-fatty acids. The compositions and methods are improved by emulsifying the vinyl chloride in the presence of sodium salts of α-sulfo-fatty acids having 12 to 24, and preferably 12 to 18 carbon atoms, wherein the sodium salts of the α-sulfo-fatty acid have a concentration of 0.6 to 4.0, and preferably 0.8 to 3.0 percent by weight based on the monomers and the polymerization is performed at a pH value of 2 to 11.

3,732,179

PROCESS FOR PREPARING POLYURETHANES FROM HYDROXY-METHYLATED DERIVATIVES OF RESIN ACIDS

John B. Lewis and Glen W. Hedrick, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application May 12, 1970, Ser. No. 36,672, now Patent No. 3,702,338. Divided and this application Mar. 15, 1972, Ser. No. 235,077
Int. Cl. C08g *9/32*
U.S. Cl. 260—24 **3 Claims**

The preparation of a new series of polyols derived from naval stores is described and their use in polyurethanes is demonstrated. Small amounts of these resin acid derivatives give added strength to polyurethane films prepared from propylene glycol polyethers and could very well be useful intermediates for industry. Increasing amounts of these new glycols blended with trimethylolpropane, 1,4-butanediol, and a polypropylene glycol and reacted with TDI gave clear strong films with tensile strengths around 5000 p.s.i. Further addition resulted in harder, more brittle films. Because of the brittle character of most of the films, use of the polymers probably would be limited to coating applications. On the other hand, change in the formulation in one instance resulted in films having fair low temperature and elastomeric properties. The diisocyanate requirements are reduced when the polyols are used as a component of the glycol system.

3,732,180

PHOTOCONDUCTIVE COMPOSITION AND METHOD

Eugene P. Gramza and David D. Schreiber, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Original application Nov. 18, 1970, Ser. No. 90,778, now Patent No. 3,684,502, dated Aug. 15, 1972. Divided and this application Dec. 27, 1971, Ser. No. 212,782
Int. Cl. C08g *51/30, 51/28*
U.S. Cl. 260—33.6 R **12 Claims**

A method is provided for forming a co-crystalline complex of pyrylium dye and polymer which involves dis-

solving the components in a solvent system in which the solubilities of the components are substantially equal. A nonpolar precipitating liquid in which the components are insoluble is combined with the solution above to produce precipitation of the complex which is then removed from the various liquids. The resultant complex is photoconductive and can be used to sensitize other photoconductors. Electrophotographic elements are prepared by dispersing the so-formed complex in a polymeric vehicle and coating the dispersion on a support.

3,732,181
POLYMER COMPOSITES REINFORCED WITH LOW-MELT GLASS

Neil Hunter Ray, Hartford, and Francis Raymond Sherliker, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Apr. 7, 1971, Ser. No. 132,180
Claims priority, application Great Britain, Apr. 17, 1970, 18,481/70
Int. Cl. C08g *51/04*
U.S. Cl. 260—41 B **20 Claims**

Composite materials of low melting inorganic oxide glass and organic polymers in which glass and polymer are co-deformable at suitable temperatures. The glasses have a transformation temperature in the range 100–400° C. Lead and zinc phosphate glasses are preferred. Methods of shaping composites and forming fibres in situ are described.

3,732,182
PROCESS FOR PREPARING LINEAR POLYESTERS

Kazuya Chimura, Kazuo Ito, Shunichi Takashima, Yoshihiro Shimoshinbara, and Mizuo Shindo, Otake, Japan, assignors to Mitsubishi Rayon Company Limited

No Drawing. Filed Apr. 20, 1971, Ser. No. 135,751
Claims priority, application Japan, May 1, 1970, 45/36,833; May 9, 1970, 45/39,045; May 19, 1970, 45/42,773; June 5, 1970, 45/48,506; Oct. 22, 1970, 45/93,095
Int. Cl. C08g *17/015*
U.S. Cl. 260—75 R **13 Claims**

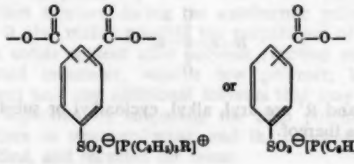
A process for preparing linear polyesters wherein polycondensation of glycol terephthalates is performed in the presence of a novel catalytic antimony compound prepared from an antimony compound having the formula $Sb(OR_1)(OR_2)(OR_3)$, such as Sb alkoxide, and α-hydroxycarboxylic acid and/or α,β - dicarboxylic acid. Resultant polyesters exhibit excellent whiteness and transparency and therefore, are particularly useful for textile fibers and films.

3,732,183
FILAMENT-FORMING SYNTHETIC LINEAR POLYESTERS MODIFIED BY SULFONATE GROUPS

Jurgen Popp, Kelkheim, Taunus, and Lieselotte Wappes, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 9, 1971, Ser. No. 179,211
Claims priority, application Germany, Sept. 11, 1970, P 20 44 931.4
Int. Cl. C08g *17/08*
U.S. Cl. 260—75 P **4 Claims**

Filament-forming synthetic polyesters having a high molecular weight and comprising links in the chain of the polymer molecule which contain sulfonate groups. These chain links containing sulfonate groups have the general formulae



(I)

in which R stands for an alkyl radical, for example, CH_3, C_2H_5, n—C_3H_7, n—C_4H_9, or the 3-sodium (sulfopropyl) radical, or the 4-sodium (sulfo-butyl) radical and are contained in the polymer in an amount of from 0.5 to 5 mol percent, calculated on the polymer unit consisting of dicarboxylic acid radical and diol radical.

3,732,184
EMULSION POLYMERIZATION METHOD

Martin K. Lindemann and Donald M. Wacome, Greenville, S.C., assignors to Chas. S. Tanner Co., Greenville, S.C.

No Drawing. Filed Apr. 22, 1971, Ser. No. 136,532
Int. Cl. C08g *22/04*
U.S. Cl. 260—77.5 BB **23 Claims**

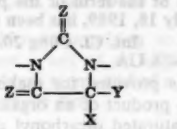
Polymer latices containing thermosetting polymers and which have the capacity to cure to greater insolubility are provided by a two stage emulsion polymerization method. The polymerization is an aqueous emulsion polymerization using a redox catalyst system in which from 35–70% of the total monomers are polymerized in the first stage, with the product being cooled prior to the introduction of the balance of the monomers.

3,732,185
POLYPARABANIC ACID DERIVATIVES

Jurgen Hocker, Cologne, and Rudolf Merten, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft

No Drawing. Filed June 28, 1971, Ser. No. 157,742
Claims priority, application Germany, June 29, 1970, P 20 32 077.8
Int. Cl. C08g *22/02*
U.S. Cl. 260—77.5 CH **9 Claims**

Polyparabanic acid derivatives which contain the structural unit:



(I)

repeatedly in one molecule; in this structural unit

Z=O or S;

X and Y, which may be the same or different, represent radicals of the formula $—NR_1R_2$; $—OR_1$ or $—SR_1$, where

R_1 represents an optionally substituted alkyl, optionally substituted alkyl, optionally substituted cycloalkyl or optionally substituted aryl radical, and

R_2 represents hydrogen or has the same meaning as R_1, or

R_1 and R_2 together can also represent an alkylene or arylene radical which joins X and Y together to form a ring, and process for their production.

3,732,186
POLYISOCYANATES CONTAINING CYCLIC IMIDE GROUPS

Willi Dunwald, Leverkusen-Alkenrath, Karl-Heinz Mielke, Cologne-Stammheim, Gerhard Muller, Leverkusen, and Rudolf Merten, Cologne-Flittard, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 688,619, Dec. 6, 1967, which is a continuation of application Ser. No. 326,606, Nov. 26, 1963, both now abandoned. This application Aug. 5, 1971, Ser. No. 169,461
Claims priority, application Germany, Jan. 8, 1963, F 38,722
Int. Cl. C08g *22/00*
U.S. Cl. 260—77.5 AM **13 Claims**

A polyisocyanate composition containing at least two free —NCO groups and at least one cyclic imide group

in the molecule and having a molecular weight of from about 200 to about 10,000 are prepared by reacting, in an inert organic solvent, aliphatic and aromatic anhydrides with organic polyisocyanates. The polyisocyanates of the invention are particularly useful as precursors in the preparation of lacquers and coatings.

3,732,187

CARBODIIMIDE FOAMS OF REDUCED BRITTLENESS PREPARED FROM RESOLE-DERIVED QUASI-PREPOLYMERS

Moses Cenker, Trenton, and Peter T. Kan, Plymouth, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Dec. 6, 1971, Ser. No. 205,393

Int. Cl. C08g *22/48*

U.S. Cl. 260—77.5 BF **5 Claims**

Rigid foams characterized by carbodiimide linkages of reduced brittleness and improved strength and heat resistance are prepared by the catalytic condensation of an NCO-terminated resole-derived quasi-prepolymer, optionally, in admixture with other organic polyisocyanates.

3,732,188

PROCESS FOR MAKING POLYIMIDE PREPOLYMER AND PRODUCT PRODUCED THEREBY

Fred F. Holub and John T. Hoback, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 26,079, Apr. 6, 1970, now Patent No. 3,678,015. This application Mar. 18, 1971, Ser. No. 125,875

The portion of the term of the patent subsequent to July 18, 1989, has been disclaimed

Int. Cl. C08g *20/00*

U.S. Cl. 260—78 UA **23 Claims**

A method is provided for making a curable prepolymeric reaction product of an organic diamine and an aliphatically unsaturated dicarbonyl compound, such as an organic anhydride or organic dicarboxylic acid. The curable prepolymeric reaction product can be heat softened to allow incorporation of filler and is convertible to the infusible state by heat or by the employment of a free radical initiator. Reaction of the organic diamine and the aliphatically unsaturated dicarbonyl compound is effected in a phenolic solvent medium. A hydrocarbon solvent optionally can serve to facilitate removal of water of reaction prior to the recovery of the reaction product of the organic diamine and the aliphatically unsaturated dicarbonyl compound. The prepolymeric reaction product can be molded to produce high temperature resistant polyimide films and structures.

3,732,189

METHOD FOR MAKING POLYIMIDES AND PRODUCTS PRODUCED THEREBY

James V. Crivello, Mechanicville, and Ann L. Seidenspinner, Burnt Hills, N.Y., assignors to General Electric Company

No Drawing. Filed Mar. 27, 1970, Ser. No. 23,492

Int. Cl. C08g *20/00*

U.S. Cl. 260—78 UA **3 Claims**

A method for making polyimide polymers is provided by effecting reaction between an aliphatically unsaturated anhydride, such as maleic anhydride, and an aryl diamine, for example 4,4′-diaminodiphenylmethane in the presence of certain acidic catalysts, such as an organic carboxylic acid. The polyimides produced by the subject method exhibit superior heat resistance, and are useful as molding compounds, laminating resins, etc.

3,732,190

SELF-CROSSLINKABLE COPOLYMERS

Gerhard Balle, Cologne-Flittard, and Gunter Kolb, Cologne-Stammheim, Germany, assignors to Bayer Aktiengesellschaft

No Drawing. Continuation-in-part of application Ser. No. 42,891, June 2, 1970. This application Sept. 22, 1971, Ser. No. 182,906

Claims priority, application Germany, July 26, 1969, P 19 38 038.2

Int. Cl. C08f *15/40*

U.S. Cl. 260—78.5 R **2 Claims**

Self-crosslinkable copolymers consisting of copolymerized units of

(A) an α-halogenoalkyl ester,
(B) one or more copolymerizable monomers which may be an ester of acrylic acid or methacrylic acid or a conjugated diene,
(C) one or more olefinically unsaturated compounds which are free of carboxyl, hydroxyl, amino and carboxylic acid amide groups and which are different from the monomers of (B) and
(D) one or more olefinically unsaturated compounds containing at least one carboxylic, hydroxyl, amino or carboxylic acid amide group

and process of crosslinking the same which comprises elimination of hydrogen halide at a pH of at least 7 and a temperature of 0 to 250° C.

3,732,191

POLYTHIOL VULCANIZATION OF EPIHALOHYDRIN ELASTOMERS

Paul P. Nicholas, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Feb. 7, 1972, Ser. No. 224,317

Int. Cl. C08g *23/00*

U.S. Cl. 260—79 **16 Claims**

Epihalohydrin elastomers are vulcanized by means of a 3-component vulcanization system comprising a polythiol, a tertiary amine, and a metal base compound. Polythiols such as 3,6-dithiaoctane-1,8-dithiol in combination with a tertiary amine such as 1,4-diaza(2.2.2)bicyclooctane, and sodium acrylate or litharge as a metal base compound vulcanize epihalohydrin elastomers such as the homopolymers of epichlorohydrin and elastomeric copolymers of epichlorohydrin and ethylene oxide forming vulcanizates of excellent physical and chemical properties. The curing system is quite flexible providing a wide variation in cure times at ordinary vulcanization temperatures.

3,732,192

RUBBER FORMULATIONS CONTAINING THIOSULFONATE ESTERS

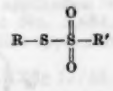
Robert J. Arnold, Chicago, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 24, 1971, Ser. No. 146,482

Int. Cl. C08f *27/06*

U.S. Cl. 260—79.5 B **10 Claims**

Controlling prevulcanization of a vulcanizable diene rubber formulation containing antiozonant and vulcanization accelerator by incorporating therein a thiolsulfonate of a particular composition having the formula

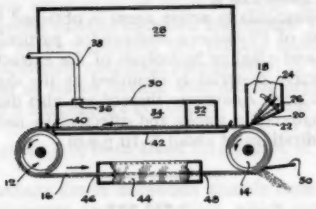


where R and R′ are aryl, alkyl, cycloalkyl or substituted derivatives thereof.

3,732,193
THIN FILM PROCESS FOR POLYMERIZATION OF WATER SOLUBLE MONOMERS

Jerry J. Svarz, La Grange, Ill., assignor to Nalco Chemical Company

Filed Apr. 28, 1971, Ser. No. 138,027
Int. Cl. C08f 3/90, 15/02, 1/00
U.S. Cl. 260—79.3 MU 5 Claims

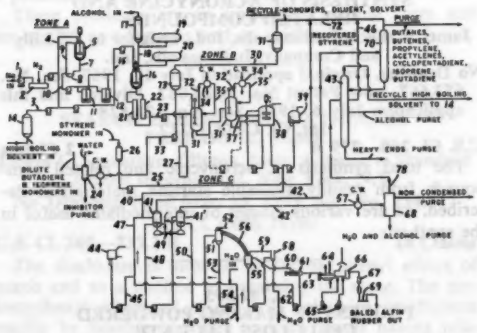


A continuous polymerization process, in which an aqueous solution of a water soluble unsaturated monomer is polymerized on a heated continuously moving belt, gives polymeric products in a dry thin film form.

3,732,194
CONTINUOUS PROCESS FOR THE PRODUCTION OF ALFIN POLYMERS

Theodore B. Baba, Hillsdale, N.J., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 672,882, Oct. 4, 1967, and Ser. No. 809,228, Mar. 31, 1969. This application Feb. 20, 1970, Ser. No. 13,242
Int. Cl. C08d 1/00, 3/06, 7/04
U.S. Cl. 260—82.1 1 Claim



A continuous process for the preparation of alfin polymers is provided, wherein monomers are polymerized in the presence of an alfin catalyst, a low boiling diluent, and a molecular weight moderator. The low boiling diluent is preferably under reflux, for cooling of the reaction mixture during the exothermic polymerization, and it also makes possible the preparation of a flowable high solids content alfin polymer reaction mixture. Unreacted monomer, volatile low polymer, low boiling diluent and any additional solvents that may be present are separated by subjecting the alfin polymer reaction mixture to steam-stripping, and the condensate may be purified, and recycled for reuse.

3,732,195
PROCESS FOR THE POLYMERIZATION OF CONJUGATED DIOLEFINS

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Original application Sept. 11, 1969, Ser. No. 857,230. Divided and this application June 21, 1971, Ser. No. 155,300
Int. Cl. C08d 1/4
U.S. Cl. 260—94.3 6 Claims

There is disclosed a process for the polymerization of butadiene and butadiene in mixture with other conjugated diolefins to form polymers containing at least 90 percent of the butadiene units in the cis-1,4 configuration comprising contacting at least one diolefin under polymerization conditions with a catalyst comprising (A) at least one organometallic compound, (B) at least one organonickel compound, and (C) at least one compound selected from a group consisting of metal fluoroborates, metal fluorophosphates, metal fluoroantimonates and organic derivatives of fluorophosphates and fluoroantimonates wherein the metal is selected from a group consisting of lithium, beryllium, calcium, magnesium, nickel and cobalt.

3,732,196
ANTI-ELECTROSTATIC LIGHT-STABLE POLYOLEFIN MOULDING COMPOSITIONS

Dieter Dieterich, Leverkusen, and Horst Niermann, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 28, 1971, Ser. No. 110,777
Claims priority, application Germany, Mar. 4, 1970, P 20 10 118.2
Int. Cl. C08f 29/04
U.S. Cl. 260—93.7 5 Claims

Moulding compositions comprising an olefin polymer and as antistatic agent a salt of an aliphatic carboxylic acid with at least 6 carbon atoms and of a 2-dialkylaminomethyl-2-alkyl-1,3-propane diol.

3,732,197
PRODUCTION OF α-OLEFIN POLYMERS

Sadao Kitagawa, Ami-machi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,925
Claims priority, application Japan, Dec. 8, 1969, 44/98,524
Int. Cl. C08f 1/56, 3/10
U.S. Cl. 260—93.7 4 Claims

At least one kind of tropylium salt (cycloheptatrienium salt) in combined with a Ziegler-Natta type catalyst (comprising basically, a compound of a transition metal of Group IV, V, or VI and an organometallic compound of a metal of Group I, II, or III) to form a highly effective catalyst whereby at least one kine of α-olefin can be polymerized to produce α-olefin polymers of high crystallinity.

3,732,198
POLYMERISATION OF ETHYLENE

Kenneth Stephenson Whiteley and Richard Roy Cooper, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,091
Claims priority, application Great Britain, Jan. 20, 1969, 3,136/69; Oct. 30, 1969, 5,324/69
Int. Cl. C08f 1/56, 1/58
U.S. Cl. 260—94.9 C 5 Claims

Ethylene is polymerised at pressures above 1,000 kg./cm.² using a catalyst comprising a compound of a transition metal and in the presence of from 0.5 to 20% (by weight on the ethylene monomer) of a compound containing a specified allylic group.

3,732,199

PEPTIDE SYNTHESIS

John S. Paul Schwarz, State College, Pa., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 741,215, June 28, 1968. This application Mar. 15, 1971, Ser. No. 124,554

Int. Cl. C07c *103/52*

U.S. Cl. 260—112.5 8 Claims

Improvement in the synthesis of peptides involving the formation of novel active intermediates. These active intermediates are formed by reaction at lowered temperatures of an imidyl halide with the tertiary ammonium salt of the acid moiety of an amino acid or peptide. The intermediate thus formed is then reacted with the amino moiety of the amino acid or peptide to be coupled, thus forming the desired peptide or polypeptide.

3,732,200

POLYAMIDE ACIDS OF CERTAIN TETRACARBOXYLIC ACIDS AND CERTAIN AZO CONTAINING DIAMINES

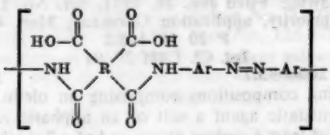
Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

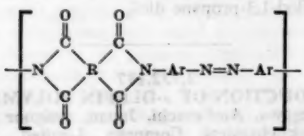
No Drawing. Continuation-in-part of application Ser. No. 792,823, Jan. 21, 1969. This application June 15, 1970, Ser. No. 46,454

Int. Cl. C08g *20/22, 20/32*

U.S. Cl. 260—144 1 Claim

Ordered fiber-forming polyamide acids and polyimides of the following respective formulas





R is tetravalent aromatic radical, Ar is an asymmetrical divalent aromatic radical with the proviso that one Ar radical is the mirror image of the other. These polymers are useful as coatings, films, fibers, foams and resins.

3,732,201

3-CHLORO - 1,2,4 - THIADIAZOLYL-5 AND 3-CHLORO - 1,2,4 - THIADIAZOLIUM-5 AZO DYESTUFFS

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy AG

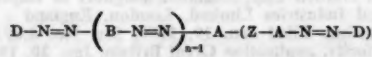
No Drawing. Filed Feb. 16, 1970, Ser. No. 11,888

Claims priority, application Switzerland, Feb. 19, 1969, 2,509/69

Int. Cl. C29b *29/10, 29/36, 29/38*

U.S. Cl. 260—153 11 Claims

A dyestuff of the formula



in which D is quaternated or unquaternated 3-halogeno-1,2,4-thiadiazolyl-5-, *n* is 1 or 2, *m* is 1 or 2, *n* and *m* together are 2 or 3, Z is a single bond, an oxygen or sulfur atom, an imido or sulfonyl group, or a divalent organic residue, B is a 1,4-phenylene residue that may be substituted, and A is the residue of a coupling component, D, B, A and Z being free from sulfonic acid groups.

3,732,202

PROCESS FOR EXTRACTING OLEANOLIC ACID-3-DIGLUCOSIDE AND PRODUCTS OBTAINED THEREFROM

Kenneth Jewers, Bromley, Kent, and Terence Albert King, London, England, assignors to The Solicitor for the Affairs of Her Majesty's Treasury, London, England

No Drawing. Filed June 19, 1969, Ser. No. 834,881

Claims priority, application Great Britain, June 21, 1968, 29,760/68

Int. Cl. C07c *47/18*

U.S. Cl. 260—210 R 11 Claims

A molluscicidally active agent is obtained by alcoholic extraction of *Phytolacca dodecandra*, particularly berries thereof, and alkaline hydrolysis of the extract.

The active material is identified as the diglucoside of oleanolic acid. Analogues thereof are also disclosed. The active material is stable and effective in natural waters at concentrations of about 5–10 p.p.m.

3,732,203

PROCESS FOR THE PREPARATION OF CARDENOLIDE- AND BUFADIENOLIDE - 3-[GLYCOSIDE-DI-ALKYL-ORTHOCARBONATES]

Ulrich Stache, Hofheim, Taunus, Kurt Radscheit, Kelkheim, Taunus, Werner Haede, Hofheim, Taunus, Werner Fritsch, Neuenhain, Taunus, and Ernst Lindner, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Dec. 4, 1970, Ser. No. 95,399

Claims priority, application Germany, Dec. 6, 1969, P 19 61 389.9

Int. Cl. C07c *173/00*

U.S. Cl. 260—210.5 10 Claims

Cardenolide- and bufadienolide-3-[glycoside-di-alkyl-othocarbonates] and process for their peparation by reaction of cardenolide- or bufadienolide-3-glycosides with a tetra- alkyl-orthocarbonate in the presence of acidic catalysts.

3,732,204

SYNTHESIS OF ACRONYCINE AND RELATED COMPOUNDS

James R. Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Original application July 17, 1967, Ser. No. 653,667, now Patent No. 3,624,087. Divided and this application July 6, 1971, Ser. No. 128,528

Int. Cl. C07d *37/12*

U.S. Cl. 260—279 R 2 Claims

The total synthesis of acronycine and related compounds from readily available starting materials is described, as are various classes of intermediates useful in the synthesis.

3,732,205

PROCESS OF MAKING POWDERED CELLULOSE LAURATE

James Teng, St. Louis County, Chokyun Rha, St. Louis, Barry L. Scallet, Clayton, and Marcella C. Stubits, St. Louis, Mo., assignors to Anheuser-Busch, Inc., St. Louis, Mo.

No Drawing. Original application July 25, 1969, Ser. No. 845,067, now abandoned. Divided and this application Jan. 15, 1971, Ser. No. 106,882

Int. Cl. C08b *3/10*

U.S. Cl. 260—224 4 Claims

Powdered cellulose laurate is prepared by reacting cellulose with a reagent containing the lauroyl grouping to produce cellulose laurate, dissolving the cellulose laurate in chloroform, adding methanol slowly until the solution becomes cloudy, then adding a substantially greater amount of methanol rapidly, and recovering a powdered cellulose laurate.

3,732,206

PREPARATION OF ETHER-ESTER STARCH DERIVATIVE

Leslie P. Kovats, Granite City, Ill., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,871

Int. Cl. C08b *19/04*

U.S. Cl. 260—233.5 7 Claims

The disclosure describes a mixed dextrin ether-ester derivative and specifically hydroxyethyl or hydroxypropyl starch dextrin ether-esters of dibasic organic acid anhydrides, preferably succinic or maleic anhydrides. The product is made by an essentially dry process involving the heating of intimately contacted hydroxyethyl or hydroxypropyl starch or starch dextrin with dibasic organic acid anhydride at a temperature of 100–160° C. in the presence of 0.5% to 10% moisture for selected times to produce a product of about 0.0016 to about 0.16 degree of substitution.

These products are in unswollen granule form and are useful as thickeners and as adhesives, which can include borax, alkali metal hydroxide and water.

3,732,207

PREPARATION OF DEXTRINS AND STARCH ESTERS

Leslie P. Kovats, Granite City, Ill., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.

No Drawing. Filed Jan. 29, 1971, Ser. No. 111,097

Int. Cl. C08b *19/04*

U.S. Cl. 260—233.5 7 Claims

The disclosure describes a starch reaction product of dibasic organic acid anhydrides and specifically starch dextrin esters and thin boiling starch esters of dibasic organic acid anhydrides, preferably succinic or maleic anhydrides. The product is made by an essentially dry process involving the heating of intimately contacted starch or starch dextrin with dibasic organic acid anhydride at a temperature of 100–155° C. in the presence of only 0.5 to 15% moisture for selected times to produce a product of 0.02 to 0.04 degree of substitution.

These products are in unswollen granule form and are useful as adhesives and as thickening agents.

3,732,208

STARCH ETHERS AND METHOD OF PREPARING SAME

Edwin L. Speakman, Clinton, Iowa, assignor to Standard Brands Incorporated, New York, N.Y.

No Drawing. Filed Mar. 13, 1972, Ser. No. 234,417

Int. Cl. C08b *19/06*

U.S. Cl. 260—233.3 R 14 Claims

The disclosure is directed to carboxyphenyl ethers of starch and to a method of preparing the same. The carboxyphenyl ethers of starch will gelatinize or disperse readily by heating in water to form pastes having relatively stable viscosity. Also, the carboxyphenyl ethers of starch have good film forming characteristics.

3,732,209

NOVEL 17β-OXYGENATED CYCLOPROPA(16α,17α) STEROIDS

Kenneth Earl Fahrenholtz, Bloomfield, and Richard Wightman Kierstead, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Mar. 15, 1971, Ser. No. 124,589

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.5 17 Claims

Novel 17β-oxygenated steroids having a fused cyclopropyl or halogenated cyclopropyl ring at the 16α,17α-positions are useful as hormonal agents, particularly as androgenic and anabolic agents.

3,732,210

PROCESS FOR THE MANUFACTURE OF PREGNANE-20-ONE-3β,5β,14β,21-TETROL

Ulrich Stache, Hofheim, Taunus, Werner Fritsch, Neuenhain, Taunus, Werner Haede, Hofheim, Taunus, and Kurt Radscheit, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Jan. 26, 1971, Ser. No. 109,932

Claims priority, application Germany, Jan. 28, 1970, P 20 03 653.7

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 R 3 Claims

A process for the manufacture of pregnane-20-one-3β,5β,14β,21-tetrol, useful as a starting material for pharmaceutically valuable compounds of the pregnane series, by converting $\Delta^{4,14}$-pregnadiene-3,20-dione-21-ol to the corresponding 3,20 - bis-alkylene-dioxy-$\Delta^{5,14}$-pregnadiene-21-ol with ethylene glycol or neopentyl glycol; acylating to form the 21-acylate and then partially de-ketalizing the acylate to produce 20-alkylene-dioxy-$\Delta^{4,14}$-pregnadiene-3-one-21-acylate; reducing the 3-keto group with an organometallic reducing agent, whereby the 21-acylate group may also be converted by the reducing agent to the 21-ol; acylating the 20-alkylene-dioxy-$\Delta^{4,14}$-pregnadiene-3,21-diol or -3-ol-21-acylate to form 20-alkylene-dioxy-$\Delta^{4,14}$-pregnadiene-3,21-diacylate; treating this with hypobromous acid to form 5α,15α-dibromo-20-alkylene-dioxy-pregnane-3β,5β,14β,21-tetrol-3,21-diacylate and debrominating with a base to form 20-alkylene-dioxy-4β(5β), 14β(15β-dioxido-pregnane-3β,21-diol or the corresponding -3,21-diacylate; and reducing to 20-alkylene-dioxy-pregnane-3β,5β,14β,21-tetrol with an organometallic reducing agent. The 20-alkylene-dioxy group is hydrolyzed to form the desired pregnane-20-one-3β,5β,14β,21-tetrol, which may be further reacted with dihydropyrane to form the corresponding -3β,21-ditetrahydropyranyl ether.

3,732,211

1-ACYLOXYETHER-1,4-BENZODIAZEPIN-2-ONES AND METHODS FOR THEIR PREPARATION

Joseph Hellerbach, Basel, Switzerland, and Armin Walser, West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed July 9, 1971, Ser. No. 162,026

Claims priority, application Switzerland, July 29, 1970, 11,438/70

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D 16 Claims

1-substituted - 1,4 - benozdiazepin-2-ones, derivatives thereof, and processes for the preparation of same are described. These compounds are useful as anti-convulsant, muscle relaxant and sedative agents.

3,732,212

1,2,3,10,11,11a-HEXAHYDRO-5H-PYRROLO[2,1-c][1,4]BENZODIAZEPINE-5,11-DIONES

Philip M. Carabateas, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,315

Int. Cl. C07d *57/02, 99/10*

U.S. Cl. 260—239.3 T 14 Claims

Heterocyclo[1,4]benzodiazepine derivatives having analgesic antagonist, anti-inflammatory, and psychomotor depressant activity.

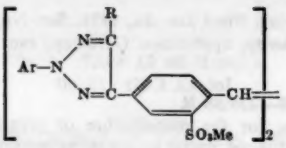
3,732,213

NOVEL TRIAZOLE COMPOUNDS

Hans Balzer, Munchenstein, Basel-Land, and Fritz Fleck, Bottmingen, Basel-Land, Switzerland, and Alec Victor Mercer, Leeds, and Roger Paver, Bradford, England, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,148
Claims priority, application Switzerland, Dec. 19, 1969, 18,918/69; Oct. 27, 1970, 15,924/70
Int. Cl. C09b *23/00*
U.S. Cl. 260—240 CA 8 Claims

Triazole derivatives of the formula



(I)

wherein Ar represents an optionally substituted aryl radical; R represents hydrogen, a low molecular alkyl radical or an optionally substituted phenyl radical; and Me represents a hydrogen, ammonium or alkali metal ion, an equivalent of an alkaline earth metal or an amine cation.

3,732,214

METHOD FOR THE SYNTHESIS OF ZEAXANTHINS, XANTHOPHYLLS, AND 3β-CAROTENE

Joseph Donald Surmatis and Armin Walser, West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Original application July 16, 1970, Ser. No. 55,565, now Patent No. 3,661,997, which is a division of application Ser. No. 617,787, Feb. 23, 1967, now Patent No. 3,558,712. Divided and this application July 16, 1971, Ser. No. 163,436
Int. Cl. C07d *13/04*
U.S. Cl. 260—240 H 7 Claims

Method by which zeaxanthins, xanthopylls and 3-oxo-β-carotene can be synthesized from the condensation product of mesityl oxide and aceto-acetic ester as well as new and novel intermediates produced in the synthesis. Zeaxanthin and xanthophyll are known coloring agents for foodstuffs, including beverages, pharmaceutical and cosmetic preparations. Furthermore, through the use of the condensation product of mesityl oxide and aceto-acetic acid, new compounds for coloring foodstuffs, including beverages, pharmaceutical and cosmetic preparations are produced.

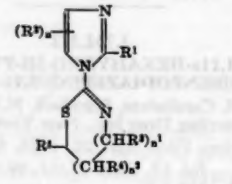
3,732,215

IMIDAZOLE DERIVATIVES

Rudiger D. Haugwitz, Highland Park, and Venkatachala L. Narayanan,, Hightstown, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Feb. 8, 1971, Ser. No. 113,693
Int. Cl. C07d *93/06, 91/32*
U.S. Cl. 260—243 R 10 Claims

Imidazole derivatives are provided having the structure



and which are useful as anthelmintic agents and anti-inflammatory agents.

3,732,216

3-HETEROARYL-2-THIO-1,3-THIAZANE-2,4-DIONES

Joseph Weinstock, Phoenixville, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,768
Int. Cl. C07d *93/06*
U.S. Cl. 260—243 R 4 Claims

3 - heteroaryl - 2-thio-1,3-thiazane-2 4-diones in which the heteroaryl moiety is pyridyl, thiazolyl, thienyl, furyl, pyridazinyl, thiadiazolyl, pyrimidyl or triazinyl and having anti-arthritic activity are generally prepared via ring closure of a β-(thiocarbamoylthio) substituted carboxylic acid with acetic anhydride/concentrated sulfuric acid.

3,732,217

2-ETHYL-1-PYRROLINE-3-CARBOXAMIDES

William B. Dickinson, Loudonville, and Philip C. Lang, Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Original application Feb. 15, 1967, Ser. No. 616,191, now Patent No. 3,624,081, dated Nov. 30, 1971. Divided and this application Oct. 19, 1970, Ser. No. 82,133
Int. Cl. C07d *27/14*
U.S. Cl. 260—247.5 R 7 Claims

Antibacterial 2 - ethyl-1-pyrroline-3-carboxamides and derivatives thereof are prepared from either 1-(2-propynyl)-2-pyrrolidinone or 1-(1,2-propadienyl)-2-pyrrolidinone and amines in the presence of base. The carboxamides react with phenyl isocyanates to produce 1-phenylcarbamyl-2-ethyl-2-pyrroline-3-carboxamides, with either an acid halide or acid anhydride to give the corresponding 1-acyl - 2 - ethylidenepyrrolidine-3-carboxamides and with hydrogen to give the corresponding 2-ethyl-pyrrolidine-3-carboxamides.

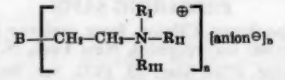
3,732,218

QUATERNARY SUBSTITUTED TRIAZINES

Hoelzle Gerd, Liestal, and Paul Ulrich, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Application Nov. 12, 1968, Ser. No. 775,208, now Patent No. 3,632,294, which is a continuation-in-part of application Ser. No. 317,138, Oct. 18, 1963. Divided and this application Feb. 4, 1971, Ser. No. 112,808
Int. Cl. C07d *55/14*
U.S. Cl. 260—248 NS 3 Claims

New quaternary nitrogen compounds and dyeing processes using these quaternary nitrogen compounds are provided. The quaternary nitrogen compounds may be represented by the formula



wherein B represents an acidifying substituent, R_I, R_{II} and R_{III} each represents an alkyl radical, or one of them represents an NH_2-group while the remaining radicals are linked together forming 5 and 6-membered cycloalkyl residues; n is a small whole number and anion$^{\ominus}$ represents the negative radical of a monobasic or polybasic acid.

The dyeing processes provided are for the coloring of fibrous materials with reactive compounds in which the quaternary nitrogen compound is employed as dyeing assistant to promote the reaction between the reactive compound and the fibrous material.

3,732,219

TETRAHYDRO-as-TRIAZINE-3(2H)THIONES

Paul E. Krieger, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 30, 1968, Ser. No. 756,412
Int. Cl. C07d *55/10*
U.S. Cl. 260—248 AS 7 Claims

Substituted tetrahydro-as-triazine-3(2H)thiones are prepared by the reaction of carbon disulfide with a sub-

stituted 2-aminoalkylhydrazine such as 1-(2-aminoethyl)-1-propylhydrazine or 1-(2-aminobutyl)-1-methylhydrazine. The novel compounds are useful as intermediates in the preparation of substituted thiazolo[3,2-b] and [2,3-c]-as-triazines. The thiazolotriazine compounds have pharmacological activity as antidepressants as indicated by their antagonism of reserpine and their potentiation of amphetamine, and are also useful in potentiation of barbiturates.

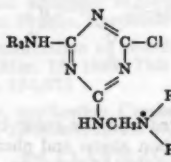
3,732,220

CHLORO-N,N-DISUBSTITUTED AMINO METHYLENE AMINO-s-TRIAZINES

John B. O'Brien, Morris Plains, Herman Stone, Morristown, and Harry E. Ulmer, Convent Station, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 16, 1970, Ser. No. 81,620
Int. Cl. C07d 55/20
U.S. Cl. 260—249.8 3 Claims

Triazines of the structure



wherein R_1 is a C_1 to C_4 alkane, phenyl or benzyl, R_2 is independently hydrogen, a C_1 to C_4 alkane, phenyl or benzyl, or R_1 and R_2 together with the

form a C_4 or C_5 heterocyclic ring and wherein R_3 is a C_1 to C_4 aliphatic hydrocarbon, are highly selective and effective herbicides.

3,732,221

HETEROCYCLIC COMPOUNDS CONTAINING ETHYLENE DOUBLE BONDS AND PROCESS FOR THEIR MANUFACTURE

Adolf Emil Siegrist, Basel, Peter Liechti, Binningen, Erwin Maeder, Aesch, Basel-Land, Leonardo Guglielmetti, Birsfelden, and Hans Rudolf Meyer and Kurt Weber, Basel, Switzerland, assignors to Ciba-Geigy A.G., Basel, Switzerland

No Drawing. Continuation of abandoned application Ser. No. 588,318, Oct. 21, 1966. This application May 11, 1971, Ser. No. 142,388
Claims priority, application Switzerland, Oct. 28, 1965, 14,902/65; July 4, 1966, 9,649/66
Int. Cl. C09b 23/00
U.S. Cl. 260—240 B 16 Claims

The present invention comprises a process for the manufacture of heterocyclic compounds containing ethylene double bonds. This process is characterised by reacting a compound of formula

(1)

in which R_1 represents a heterocyclic ring system of aromatic character which (a) contains at least one 5-membered or 6-membered heterocyclic ring with at least one ring nitrogen atom, (b) is free of hydrogen atoms which (1) are bonded to ring nitrogen atoms and (2) which are replaceable by alkali metal, and (c) is bonded to a ring member of R_2 by means of a ring member or has two adjacent ring members in common with two adjacent ring members of R_2, in which R_2 denotes a carbocyclic or heterocyclic ring system of aromatic character which contains 6 ring members, and which optionally is condensed with further aromatic or hydroaromatic ring systems, and in which (b) the methyl group shown in the formula is in a p-position to the bond to R_1, is reacted with a Schiff base in the presence of a strongly basic alkali compound, with the reaction medium to be used being a strongly polar, neutral to basic, organic solvent which (I) is free of atoms, especially hydrogen atoms, which are replaceable by alkali metal and (II) is practically anhydrous, except in the case of the use of an alkali hydroxide as the strongly basic alkali compound in which case the alkali hydroxide may have a water content of up to 25%.

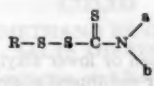
3,732,222

CYCLOALKYL AMINOTHIOCARBONYL DISULFIDES

Eiichi Morita, Copley, Ohio, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 28, 1970, Ser. No. 76,277
Int. Cl. C07d 87/46
U.S. Cl. 260—247.1 6 Claims

Cycloalkyl aminothiocarbonyl disulfides of the formula



wherein

is an amino radical in which *a* and *b* independently are alkyl, cycloalkyl, or aralkyl or together with the nitrogen atom form a heterocycle, and R is cycloalkyl are prepared by reacting carbon disulfide with the appropriate sulfenamide. The new disulfides are excellent vulcanization accelerators.

3,732,223

s-TRIAZINYL-ISOCYANATES

Ulrich von Gizycki and Günter Oertel, Cologne-Flittard, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 18, 1970, Ser. No. 64,814
Claims priority, application Germany, Aug. 28, 1969, P 19 43 635.2
Int. Cl. C07d 55/50
U.S. Cl. 260—249.8 8 Claims

s-Triazinyl mono- and di-isocyanates are prepared, the latter compounds being new compositions, by a process which comprises reacting s-triazinyl mono- and di-amines with oxalyl chloride. The s-triazinyl isocyanates are particularly useful as precursors in the manufacture of polyurethane resins.

3,732,224

METHOD OF CONTROLLING PLANT GROWTH AND 3-SUBSTITUTED LUMAZINES USED IN SUCH METHOD

Richard L. Jacobs, Perrysburg, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

No Drawing. Continuation-in-part of applications Ser. No. 740,045, and Ser. No. 740,099, both June 26, 1968, both now abandoned. This application Oct. 20, 1969, Ser. No. 867,873
Int. Cl. C07d 51/46
U.S. Cl. 260—251.5 5 Claims

A method for controlling plant growth and new compounds used in such method. The method includes the

step of applying the new compounds to the locus to be protected. The compounds are 3-substituted-lumazines, where the 3-substituent is a member of the group consisting of alkyl groups having from 2 to 8 carbon atoms and cycloalkyl groups having from 3 to 12 carbon atoms.

3,732,225

PYRAZOLO[3,4-d]PYRIMIDINE DERIVATIVES

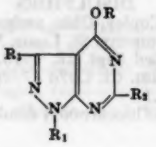
Hermann Breuer, Burgweinting, and Uwe D. Treuner and Ernst Schulze, Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed July 23, 1970, Ser. No. 57,828

Int. Cl. C07d 5/46

U.S. Cl. 260—256.4 F **4 Claims**

New pyrazolo[3,4-d]pyrimidine derivatives which have the formula



wherein R is hydrogen or lower alkyl, R_1 is lower alkyl, cycloalkyl, phenyl or substituted phenyl, R_2 is cycloalkyl, phenyl or substituted phenyl and R_3 is hydrogen, lower alkyl, cycloalkyl, phenyl or substituted phenyl, and salts thereof, are useful as hypoglycemic agents and anti-inflammatory agents.

3,732,226

4-[(2 - CYANOETHYL)AMINO] - 2 - PHENYL-5-PYRIMIDINECARBOXYLIC ACID ESTERS

Arthur A. Santilli, Havertown, and Dong H. Kim, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Aug. 14, 1968, Ser. No. 752,485, now Patent No. 3,641,027, dated Feb. 8, 1972. Divided and this application Apr. 23, 1971, Ser. No. 136,670

Int. Cl. C07d 51/42

U.S. Cl. 260—256.4 N **6 Claims**

The disclosure is directed to 5,6,7,8-tetrahydro-5-oxopyrido[2,3-d]pyrimidine-6-carbonitriles and to carboxylic-acid esters which are intermediates in their preparation. Both the final products and the intermediates have central nervous system activity as depressants.

3,732,227

4-[(CYANOMETHYL)ALKYLAMINO] - 2 - PHENYL-5 - PYRIMIDINOCARBOXYLIC ACIDS, ALKYL ESTERS

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Aug. 14, 1968, Ser. No. 752,486, now Patent No. 3,575,977, dated Apr. 20, 1971. Divided and this application Dec. 30, 1970, Ser. No. 103,006

Int. Cl. C07d 51/42

U.S. Cl. 260—256.4 N **3 Claims**

The disclosure is directed to 7-alkyl-2,5,6-trisubstituted-7H-pyrrolo[2,3-d]pyrimidines and to the 4-[(cyanomethyl)alkylamino]-2-substituted-5-pyrimidine carboxylic acid esters which are intermediates in their production. The compounds have central nervous system activity as depressants.

3,732,228

TETRAHYDROPYRIMIDINES

Daniel Bertin, Jacques Perronnet, and Andre Teche, Paris, France, assignors to Roussel-UCLAF, Paris, France

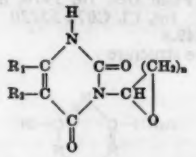
No Drawing. Filed Mar. 22, 1971, Ser. No. 126,865

Claims priority, application France, Mar. 26, 1970, 7010906; Jan. 28, 1971, 7102829

Int. Cl. C07d 51/30

U.S. Cl. 260—260 **11 Claims**

1,2,3,4-tetrahydropyrimidine-2,4-diones of the formula



(I)

wherein R_1 is selected from the group consisting of lower alkyl of 1 to 7 carbon atoms and phenyl, R_2 is selected from the group consisting of hydrogen, chlorine, bromine and lower alkyl of 1 to 7 carbon atoms and *n* is 3 or 4 which have herbicidal activity and their preparation and intermediates therefor.

3,732,229

3-CYCLOHEXYL PHENYL-2-HYDROXYPROPYL-4-PHENYL PIPERAZINES

Peter Thomas Bysouth and Robert William Clarke, London, England, assignors to The British Drug Houses Limited, Middlesex, England

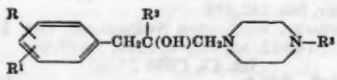
No Drawing. Continuation of abandoned application Ser. No. 740,881, June 28, 1968. This application June 23, 1971, Ser. No. 156,092

Claims priority, application Great Britain, July 5, 1967, 30,873/67

Int. Cl. C07d 51/70

U.S. Cl. 260—268 PH **13 Claims**

Novel substituted piperazine compounds of the formulae



wherein

R is hydrogen or alkoxy having from 1 to 8 carbon atoms;

R^1 is alkyl having up to 10 carbon atoms, alkoxy having up to 10 carbon atoms, cycloalkyl having from 5 to 7 carbon atoms, cycloalkyloxy having from 5 to 7 carbon atoms, cycloalk-1-enyl having from 5 to 7 carbon atoms, phenyl, phenoxy or halogen;

R^2 is hydrogen or methyl;

R^3 is 2-hydroxycyclohexyl, 2-pyridyl, phenyl, dimethoxyphenyl, chloronitrophenyl, chloromethoxyphenyl, and methyldisulphamoylphenyl, phenyl substituted with a group selected from those consisting of alkyl having up to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, fluorine, chlorine, bromine, nitro, amino, sulphamoyl, hydroxy, trifluoromethyl and acetamido; and

Their pharmaceutically acceptable acid addition salts.

3,732,230

LIQUID PHASE POLYCHLORINATION OF PYRIDINE HYDROCHLORIDES

Thomas K. Brewer, El Sobrante, and Charles D. Crawford, Fullerton, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,879

Int. Cl. C07d *31/26, 33/36*

U.S. Cl. 260—283 R 11 Claims

Polychlorinated derivatives of aromatic N-heterocyclic compounds are prepared by carrying out the chlorination step in a liquid phase operation while employing hydrogen chloride partial pressures of at least about 30 pounds per square inch gauge.

3,732,231

D-6-METHYL-8-CYANO METHYLERGOLINE (I) AND METHOD OF MAKING THE SAME

Miroslav Semonsky and Norbert Kucharczyk, Prague, Czechoslovakia, assignors to Spofa, United Pharmaceutical Works, Prague, Czechoslovakia

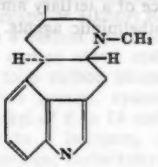
No Drawing. Continuation of abandoned application Ser. No. 713,297, Mar. 15, 1968. This application June 18, 1971, Ser. No. 154,672

Claims priority, application Czechoslovakia, Mar. 16, 1967, 1,920/67, 1,921/67, 1,922/67

Int. Cl. C07d *43/20*

U.S. Cl. 260—285.5 1 Claim

D-6-methyl-8-cyano methylergoline having the formula



prepared by reacting D-6-methyl-8-hydroxymethylergoline (I) with phosphoryl chloride and thereafter reacting the D-6-methyl-8-chloromethylergoline formed with an alkali metal cyanide. The compounds of the invention constitute antifertility and lactation inhibiting agents.

3,732,232

PROCESS FOR THE PREPARATION OF IMIDAZOISOQUINOLINEDIONE COMPOUNDS

Erik Regel, Wuppertal-Cronenberg, Ludwig Eue, Cologne, and Karl Heinz Buchel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

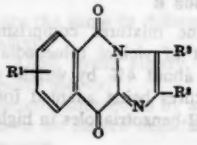
No Drawing. Filed Aug. 30, 1971, Ser. No. 176,251

Claims priority, application Germany, Sept. 3, 1970, P 20 43 649.1

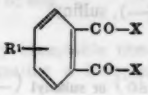
Int. Cl. C07d *57/04*

U.S. Cl. 260—288 R 24 Claims

Imidazoisoquinolinediones of the formula

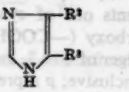


are prepared smoothly and without substantial by-product formation by reacting a phthalic acid halide of the formula



(2)

with an imidazole of the formula



(3)

R^1 is hydrogen, alkyl, halogen, nitro or alkoxy, or aryl which may be substituted by alkyl, halogen, haloalkyl or nitro,

R^2 and R^3 individually are hydrogen, alkyl, aryl or halogen or, together with the intermediate two carbon atoms of the imidazole ring, represent a benzene ring, which may be substituted by halogen, nitro or trifluromethyl; and

X is halogen, preferably chlorine. The products are herbicides.

3,732,233

TETRAHYDROMETHANO BENZOXAZOCINS AND SALTS THEREOF

Harry G. Pars, Lexington, and Raj K. Razdan, Belmont, Mass., assignors to Beecham Group Limited, Brentford, Middlesex, England

No Drawing. Continuation-in-part of application Ser. No. 821,125, May 1, 1969, which is a continuation-in-part of application Ser. No. 707,448, Feb. 23, 1968. This application July 23, 1970, Ser. No. 57,783

Int. Cl. C07d *99/04*

U.S. Cl. 260—293.55 13 Claims

Novel compounds are provided which are 3,4,5,6-tetrahydro-2,6-methano-2H-1,5-benzoxazocin compounds, salts thereof, intermediates therefor and their production. Typical compounds are 2,5 - dimethyl-3,4,5,6-tetrahydro-2,6-methano-2H-1,5-benzoxazin-7-ol and 2,8-dimethyl-3,4,5,6-tetrahydro-2,6-methano-2H-1,5-benzoxazocin. The compounds including their stereo and geometric isomers may be in the form of their acid-addition salts, alkali metal salts and N-oxides and are formulated with the usual excipients or carriers into unit dosage form for use as analgesics and having beneficial central nervous system activity.

3,732,234

(THIO-, SULFINYL- AND SULFONYL) CONTAINING PYRIDINE COMPOUNDS

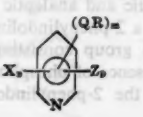
Penelope B. Domenico, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Sept. 26, 1969, Ser. No. 861,506, now Patent No. 3,639,413, dated Feb. 1, 1972. Divided and this application May 17, 1971, Ser. No. 144,331

Int. Cl. C07d *21/48, 31/50*

U.S. Cl. 260—294.8 F 7 Claims

The present disclosure is directed to (thio-, sulfinyl- and sulfonyl) containing pyridine compounds corresponding to the formula



wherein R represents hydrogen, alkyl monohalololoweralkyl, alkenyl, monohaloalkenyl, cycloalkyl, monohalocycloalkyl, phenyl, aralkyl, alkaryl or monohalophenyl; Q represents sulfide (—S—), sulfinyl

$$(-\overset{|}{S}O) \text{ or sulfonyl } (-\overset{|}{S}O_2)$$

each X independently represents chlorine, bromine or fluorine; Z represents one of cyano (—CN), carbamoyl ($—CONH_2$) of carboxy (—COOH) or the salts thereof; *n* represents an integer of 0 to 3, inclusive; *m* represents an integer of 1 to 3, inclusive; *p* represents an integer of 1 or 2 and the sum of $n+m+p$ equals an integer of 2 to 5, inclusive, with the proviso that when Q is other than sulfide (—S—), R is other than hydrogen and when R is H, *m* is not greater than 2. The preparation of these compounds and their utility as pesticides is also taught.

3,732,235

SALT OF PYRIDOXINE ALPHA-KETOGLUTARATE WITH 5-HYDROXYTRYPTOPHANE

Cristobal Martinez, Miguel Fernandez, and Rodrigo Carmona, Madrid, Spain, assignors to Laboratories Made, S.A., Madrid, Spain

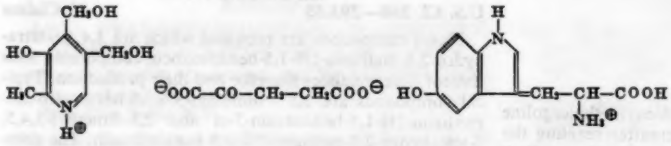
No Drawing. Filed Feb. 23, 1971, Ser. No. 118,151

Claims priority, application Spain, Feb. 25, 1970, 376,906

Int. Cl. C07d *31/34, 31/28*

U.S. Cl. 260—295 R **1 Claim**

A compound of the formula:



The compound is prepared by reacting pyridoxine alpha-ketoglutarate with 5-hydroxytryptophane. The compound is useful for treating deficiencies in neuronal metabolism, tremors, infant's convulsions, nervous troubles caused by administration of isoniazed, difficulties in neuromuscular activity, alcoholism, atherosclerosis, anaemias, cirrhosis, skin diseases, etc.

3,732,236

2-PHENYL-INDOLINE AMIDINES

Yao Hua Wu and Walter G. Lobeck, Jr., Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

No Drawing. Filed Apr. 12, 1971, Ser. No. 133,365

Int. Cl. C07d *27/38*

U.S. Cl. 260—296 B **14 Claims**

Indoline amidines which have a 2-phenyl substituent are effective diuretic and analeptic agents. They are prepared by reacting a 2-phenylindoline with a carboxamide selected from the group consisting of formamides and lactams in the presence of phosphorus oxychloride. Typical examples of the 2-phenylindoline amidines are 2-phenyl-1-[7 - (3,4,5,6-tetrahydro 2H-azepinyl)]indoline and 1-(tert.-butyliminomethyl)-2-phenylindoline.

3,732,237

5-NITRO-2-THIAZOLECARBOXAMIDOXIME AND DERIVATIVES THEREOF

Uwe Treuner, Regensburg, and Hermann Breuer, Burgweinting, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed May 25, 1971, Ser. No. 146,813

Int. Cl. C07d *91/32*

U.S. Cl. 260—302 R **9 Claims**

5-nitro-2-thiazolecarboxamidoxime may be used to produce a series of derivatives which are useful as antimicrobial agents.

3,732,238

CARBAMOYLBENZOTRIAZOLE ANTHELMINTICS

Maurice William Baker, Clifton, Jennifer Crowley, Newark, Thomas Iswel Watkins, West Bridgford, and Nigel George Clark, St. Albans, England, assignors to Boots Pure Drug Company, Nottingham, England

No Drawing. Filed July 14, 1971, Ser. No. 162,622

Claims priority, application Great Britain, Aug. 5, 1970, 37,878/70

Int. Cl. C07d *55/04*

U.S. Cl. 260—308 B **5 Claims**

N-dialkylcarbamoylbenzotriazoles are prepared by reacting the appropriate carbamoyl chloride with benzotriazole in the presence of a tertiary amine. The compounds have activity as anthelmintic agents. An example of the invention is (N - methyl-N-n-heptylcarbamoyl)benzotriazole as a mixture or as its 1 or 2 isomer.

3,732,239

4- AND 5-METHYL-1H-BENZOTRIAZOLES PREPARED FROM VICINAL TOLUENEDIAMINE MIXTURES

Sydney M. Spatz, Williamsville, Maurice E. Bailey, Orchard Park, and Francis E. Evans, Hamburg, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application June 20, 1969, Ser. No. 835,257, now Patent No. 3,637,514, dated Jan. 25, 1972. Divided and this application Nov. 5, 1971, Ser. No. 196,239

Int. Cl. C07d *55/04*; C23f *11/14*

U.S. Cl. 260—308 B **3 Claims**

Toluenediamine mixtures comprising at least about 96% by weight of vicinal toluenediamine isomers and not more than about 4% by weight of non-vicinal isomers, said mixtures being adapted for conversion to 4- and 5-methyl-1H-benzotriazoles in high yields.

3,732,240
THIAZOLO[3,4-a]BENZIMIDAZOLE DERIVATIVES AND PROCESS

Rudiger D. Haugwitz, Highland Park, and Venkatachala L. Narayanan, Hightstown, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Jan. 21, 1971, Ser. No. 108,600
Int. Cl. C07d 99/06
U.S. Cl. 260—306.7 6 Claims

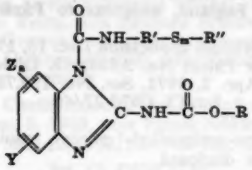
Thiazolo[3,4-a]benzimidazoles are provided which are useful as antiparasitic and antiinflammatory agents.

3,732,241
HYDROCARBYL-1-(SUBSTITUTED CARBAMOYL)-2-BENZIMIDAZOLE CARBAMATES

Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed June 12, 1970, Ser. No. 46,565
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 7 Claims

Compound of the formula



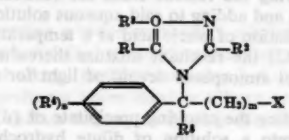
wherein Y is hydrogen, chlorine, methyl, nitro or an alkoxy group of 1 to 4 carbon atoms; Z is hydrogen, halogen or an alkyl group of 1 to 4 carbon atoms; *n* is from 1 to 3; *m* is 1 or 2; R is an aliphatic hydrocarbon containing 1 to 4 carbon atoms optionally substituted with halogen, hydroxy, cyano or alkoxy; R' is a divalent alkylene radical of 1 to 4 carbon atoms or a divalent arylene radical of 6 to 10 carbon atoms and R'' is an aliphatic hydrocarbon of 1 to 6 carbon atoms substituted with 0 to 5 halogens, nitro groups, cyano groups or alkoxy groups; aryl or aralkyl of 6 to 14 carbon atoms nuclearly substituted with 0 to 5 halogens, nitro groups, cyano groups or alkoxy groups; carbalkoxymethyl in which the alkyl group is of 1 to 6 carbon atoms and in which the methyl group has 0 to 2 halogen atoms. These compounds are fungicides and ovicides.

3,732,242
PHENYL-IMIDAZOLYL ACETIC OR PROPIONIC ACID DERIVATIVES

Karl Heinz Buchel, Werner Meiser, Manfred Plempel, and Carl Metzger, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 18, 1970, Ser. No. 38,531
Claims priority, application Germany, May 21, 1969, P 19 25 994.0
Int. Cl. C07d 49/00
U.S. Cl. 260—309 41 Claims

Phenyl-imidazolyl-fatty acid derivatives of the formula:



wherein

R^1, R^2, and R^3 are the same or different, and are hydrogen or lower alkyl;

R^4 is hydrogen, alkyl, lower alkoxy, alkylmercapto, or an electro negative moiety;

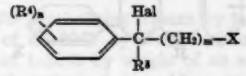
R^5 is benzene, benzene substituted by alkyl, lower alkoxy, alkylmercapto or an electro negative moiety, or R^5 is an aliphatic moiety;

X is a carboxyl moiety or a grouping of a functional carboxylic acid derivative;

m is 0, 1, 2, 3, 4, 5 or 6; and

n is 0, 1 or 2,

and pharmaceutically acceptable non-toxic salts thereof are produced by reacting a halogen derivative of the formula:

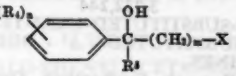


wherein

R^4, R^5, X, *m* and *n* are as above defined, and

Hal is halogen,

with an optionally alkyl substituted imidazole in the presence of acid-binding base or an excess of imidazole, preferably in an inert polar solvent at a temperature of from about 20° C. to about 180° C., or reacting the above halogen derivative with an alkali metal or silver salt of an optionally alkyl substituted imidazole in an inert solvent at a temperature of from about 20° C. to about 200° C., or reacting a hydroxy compound of the formula:



wherein R^4, R^5, X, *m* and *n* are as above defined,

with an optionally alkyl-substituted imidazole.

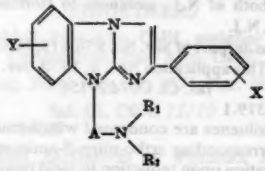
These phenyl-imidazolyl-fatty acid derivatives exhibit antimycotic activity.

3,732,243
2-(p-BROMOPHENYL) - 9 - DIMETHYL-AMINO-PROPYL-9H-IMIDAZO[1,2-a]BENZIMIDAZOLE

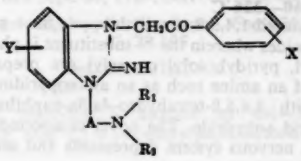
Haruo Ogura, Tsuneo Itoh, Hiroaki Takayanagi, Yukio Yamazaki, and Hiromu Takagi, Tokyo, Japan, assignors to Sankyo Company Limited and Kodama Limited, both of Tokyo, Japan

No Drawing. Filed June 17, 1971, Ser. No. 154,214
Claims priority, application Japan, June 23, 1970, 45/54,600; June 26, 1970, 45/55,791
Int. Cl. C07d 57/02
U.S. Cl. 260—309.2 1 Claim

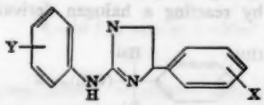
Imidazo[1,2-a] benzimidazole derivatives having the formula



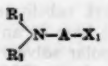
wherein X represents a halogen atom or nitro group, Y represents hydrogen atom, a halogen atom or a lower alkyl group, R_1 and R_2 may be the same or different and each represents hydrogen atom or a lower alkyl group and A represents a lower alkylene group and a pharmaceutically acceptable acid addition salt thereof. The products have pharmacological properties and are useful as analgesic agents and prepared by heating a compound having the formula



wherein X, Y, R_1, R_2 and A are the same as above or a pharmaceutically acceptable acid addition salt thereof in the presence or absence of a condensing catalyst and an inert organic solvent or reacting a compound having the formula



wherein X and Y are the same as above with a compound having the formula



wherein R_1, R_2 and A are the same as above and X_1 represents an acid radical of a reactive ester in the presence of a base.

3,732,244

1,3-DIOXY - 2-SUBSTITUTED-4,4,5,5-TETRAHYDROCARBON SUBSTITUTED - Δ^2 - DIHYDRO- AND IMIDAZOLINES

David G. B. Boocock, Scarborough, Ontario, Canada, and Edwin F. Ullman, Atherton, Calif., assignors to Syva Corporation, Palo Alto, Calif.

No Drawing. Continuation-in-part of application Ser. No. 724,591, Apr. 26, 1968. This application Mar. 22, 1971, Ser. No. 126,985

Int. Cl. C07d 49/34

U.S. Cl. 260—309.6 13 Claims

Δ^2-dihydro- and imidazoline having disubstitution in both the 4 and 5 positions of the ring, wherein both the nitrogen atoms in the ring are bonded to oxygen. Substituted at the two position are halogen, oxy and oxo groups. Preferred compounds have a nitroxide functionality in conjugation with a nitronyl functionality.

3,732,245

PROCESS AND INTERMEDIATES FOR THE PREPARATION OF INDOLES FROM ORTHO-NITROTOLUENES

Andrew David Batcho, Belleville, and Willy Leimgruber, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 876,619, Nov. 24, 1969, abandoned. This application Nov. 4, 1970, Ser. No. 86,953

Int. Cl. C07d 27/56

U.S. Cl. 260—319.1 16 Claims

Ortho-nitrotoluenes are condensed with formamide acetals to yield the corresponding ortho-nitro-β-aminostyrenes which undergo cyclization upon reduction to yield indoles.

3,732,246

N-SUBSTITUTED NAPHTHALENE-DICARBOXIMIDES

Eugene R. Wagner, Zionsville, Ind., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application May 24, 1968, Ser. No. 731,744, now Patent No. 3,546,238. Divided and this application Sept. 25, 1970, Ser. No. 75,763

Int. Cl. C07d 27/52

U.S. Cl. 260—326 C 5 Claims

N-substituted-1,4,5,8-tetrahydro - 4a,8a - naphthalenedicarboximides wherein the N-substituent is phenyl, monohalophenyl, pyridyl, tolyl or xylyl are prepared by the reaction of an amine such as an aminopyridine or a haloaniline with 1,4,5,8-tetrahydro-4a,8a-naphthalene dicarboxylic acid anhydride. The novel compounds are useful as central nervous system depressants and sedatives.

3,732,247

3-DI-SUBSTITUTED METHYLENE PYRROLIDINES WHEREIN THE 1- OR N-LOWER-ALKYL SUBSTITUENT CONTAINS AT LEAST TWO CARBON ATOMS

Grover C. Helsley and Carl D. Lunsford, Richmond, Va., and John A. Richman, Jr., Rockville, Md., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Continuation-in-part of application Ser. No. 812,975, Apr. 1, 1969. This application Aug. 14, 1970, Ser. No. 63,916

Int. Cl. C07d 27/04

U.S. Cl. 260—326.8 5 Claims

Certain 3-di-substituted methylene pyrrolidines having a 1- or N-lower-alkyl substituent having at least two carbon atoms are especially effective anti-depressants. The compounds have the formula given immediately below.

3,732,248

3-SUBSTITUTED-1-PHENYL INDOLINONES

Antonio Canas-Rodriguez and Peter Rodway Leeming, Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

No Drawing. Original application Dec. 15, 1969, Ser. No. 885,321, now Patent No. 3,644,403. Divided and this application Apr. 2, 1971, Ser. No. 130,782

Int. Cl. C07d 27/40

U.S. Cl. 260—325 4 Claims

Novel 3-mono-aminoalkyl-1-phenyl indolines and 2-indolinones are disclosed.

3,732,249

ACIDIC CITRATE OF BUFOTENIDINE AND ITS PREPARATION

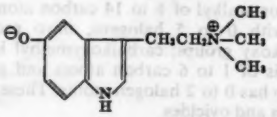
Otoharu Ishizaka, Tokyo, Japan, assignor to Kyushin Seiyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Jan. 14, 1971, Ser. No. 106,528

Int. Cl. C07d 27/56

U.S. Cl. 260—326.15 8 Claims

An acidic citrate of the compound bufotenidine of the formula



is provided having improved stability and in flavorless and readily dissolvable form. The process comprises

(a) immersing fine particles of the crude drug *Bufonis venenum* with ethyl acetate for at least six hours at room temperature;

(b) immersing the residue separated from said ethyl acetate with from about 15 to about 25 parts of an alcohol at a temperature below 40° C.;

(c) immersing the residue of the resultant alcoholic solution in water at room temperature in an atmosphere devoid of light for 1–3 hours;

(d) removing the residue from the resultant aqueous solution and adding to said aqueous solution an alcoholic solution of picric acid at a temperature of 15° to 40° C., the resultant mixture thereafter standing in a cool atmosphere devoid of light for at least 24 hours;

(e) collecting the resulting precipitate of (d) and adding thereto a solution of dilute hydrochloric acid, thereafter adding an ether solution thereto and allowing the resultant mixture to stand quietly;

(f) separating the ether phase from the mixture of (e) to yield an aqueous solution, to which are successively added citric acid and sodium hydrogen carbonate; and

(g) removing the water from the resultant solution to yield said acidic citrate.

3,732,250

PREPARATION OF THIOLACTONES

Peter E. Fritze, West Millington, and George L. Brode, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed May 20, 1971, Ser. No. 145,464

Int. Cl. C07d *63/06, 61/00; 67/00*

U.S. Cl. 260—327 R 11 Claims

Thiolactones have been prepared by contacting lactones in the vapor phase with a sulfur containing donor over a Lewis base in an inert atmosphere at a temperature of about 150 to 350° C.

3,732,251

BASICALLY SUBSTITUTED COUMARIN COMPOUNDS

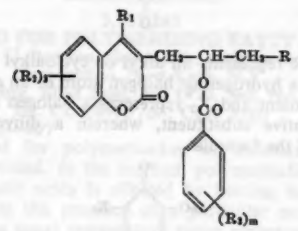
Rudi Beyerle, Bruchkobel, and Adolf Stachel, deceased, by Ingeburg Lydia Katharina Stachel, Rolf-Eberhard Nitz, Klaus Resag, and Eckhard Schraven, Frankfurt am Main, Germany, assignors to Cossella Farbwerke Manikur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

No Drawing. Continuation-in-part of application Ser. No. 789,919, Jan. 8, 1969, now Patent No. 3,652,557. This application May 12, 1971, Ser. No. 142,757

Int. Cl. C07d *7/26*

U.S. Cl. 260—343.2 R 7 Claims

The present invention relates to new coumarin compounds useful as coronary dilators and having the structural formula



or the hydrochloric acid addition salts thereof wherein

R stands for the radical of an alkyl, alkenyl, cycloalkyl, aralkyl or aryl amine which is bound via a nitrogen atom, or for the group

X representing a lower cyanoalkyl, alkylcarbonylalkyl, alkoxycarbonylalkyl or amidocarbonylalkyl group, the alkyl and alkoxy groups containing 1–4 carbon atoms, Y representing a lower alkyl or alkoxy group containing 1–4 carbon atoms, or having the same meaning as X;

R_1 is selected from the group consisting of alkyl radicals having 1–4 carbon atoms and phenyl radicals;

R_2 is selected from the group consisting of 5,7-, 6,7-, and 7,8-positioned alkoxy groups having 1–4 carbon atoms;

R_3 is selected from alkoxy groups having 1–4 carbon atoms and

m is selected from the group consisting of 1, 2 and 3.

3,732,252

METHOD FOR THE SYNTHESIS OF TRIOXAN

Hiroyasu Komazawa and Osamu Matsuno, Fuji, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

No Drawing. Filed Dec. 29, 1971, Ser. No. 213,728

Int. Cl. C07d *21/00*

U.S. Cl. 260—340 1 Claim

A process for synthesizing trioxan by heating an aqueous solution of 25–80% by weight of formaldehyde in the presence of 1–20% by weight of an acidic substance as catalyst, characterized by adding one or more of soluble organic compounds such as alcohols, ethers or esters having a dielectric constant of less than 40 in such an amount as defined below:

(1) $\geqq 0.0233$ (wt. percent) × (wt. percent of water in the reaction mixture) for the compound having a dielectric constant of less than 10.

(2) $\geqq 0.00233 \times$ (dielectric constant) × (wt. percent of water in the reaction mixture) for the compound having a dielectric constant of 10.1–20.

(3) $\geqq \{0.0325$ (dielectric constant $-20) + 0.0465\} \times$ (wt. percent of water in the reaction mixture) for the compound with a dielectric constant of 20.1–40.

3,732,253

α-HALO-PHENYLACETAMIDES

Bruno Cavalleri and Anna Sardi, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Filed Dec. 30, 1970, Ser. No. 102,932

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 13 Claims

α-Halo-phenylacetamide compounds, such as N-phenethyl-α-fluorophenylacetamide, N-(4-ethoxyphenethyl)-α-fluorophenylacetamide and N-(3,4-dimethoxyphenethyl)-α-bromophenylacetamide, are prepared by the reaction of an α-halo substituted phenylacetyl halide with a substituted phenethylamine in the presence of an anion acceptor such as a tertiary amine. The α-halo-phenylacetamide compounds have pharmacological activity on the cardiovascular system, and are particularly active as coronary dilators.

3,732,254

SESAMOLYL AND PIPERONYL ETHERS AND THIOETHERS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Feb. 25, 1971, Ser. No. 119,041

Int. Cl. C07d *13/10*

U.S. Cl. 260—340.5 11 Claims

Novel phenyl derivatives of Formula I formed by mercuric salt addition of water or alcohol useful for control of insects.

3,732,255

PROCESS FOR OPTICAL RESOLUTION OF O-ACETYLPANTOLACTONE

Saburo Nabeta, Ieji Kuniyoshi, and Masahiro Inagaki, Chiba, Japan, assignors to Daiichi Seiyaku Company, Limited, Tokyo, Japan

Filed Sept. 30, 1969, Ser. No. 862,436

Claims priority, application Japan, Sept. 30, 1968, 43/70,105

Int. Cl. C07d *5/06*

U.S. Cl. 260—343.6 6 Claims

Optically resolving a mixture of D(−)-O-acetylpantolactone and L(+)-O-acetylpantolactone by seed-

ing a homogeneous liquid mixture of these two materials with optically active seed crystals of either of the two enantiomers in a binary system. The same isomer as the seed crystals is crystallized and the precipitate can be recovered.

3,732,256

REDUCED MALEOPIMARIC ACID AND PROCESS FOR ITS PREPARATION

Walter H. Schuller and Ray V. Lawrence, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application Apr. 15, 1970, Ser. No. 28,944, now Patent No. 3,637,600. Divided and this application Mar. 26, 1971, Ser. No. 128,579

Int. Cl. C07c *61/14*

U.S. Cl. 260—346.3 2 Claims

This invention relates to the preparation of reduced maleopimaric acid from reduced fumaropimaric acid, the preparation of the acid chloride of reduced maleopimaric acid, and the reaction of the acid chloride with diamines to give polyimide-amides, useful for the preparation of films.

3,732,257

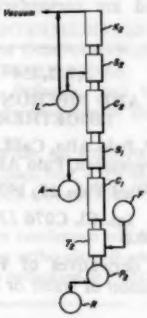
TRIMELLITIC ACID ANHYDRIDE PRODUCT RECOVERY BY STEAM STRIPPING CRUDE ANHYDRIDE OF TOTAL SOLIDS FROM PSEUDOCUMENE OXIDATION EFFLUENT AND CONTINUOUS FRACTIONATION OF STRIPPED PRODUCT

James O. Knobloch, Naperville, and J. Michael Woollen, Chicago, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed July 1, 1971, Ser. No. 158,907

Int. Cl. B01d *3/38*; C07c *63/02, 63/32*

U.S. Cl. 260—346.4 5 Claims



Fluid effluent from pseudocumene oxidation with molecular oxygen in the presence of acetic acid as reaction medium under liquid phase conditions or concentrate thereof is subject to simultaneous stripping of reaction medium, thermal conversion of its trimellitic acid content to crude trimellitic anhydride and steam stripping at atmospheric pressure followed by continuous fractionation of the crude anhydride to recover product anhydride of improved color and color stability. Such anhydride recovery avoids inefficiency of trimellitic acid recovery from fluid oxidation effluent by crystallization, long residence of crude anhydride at high temperature in batchwise distillation with its attendant double anhydride formation and loss of desired anhydride product.

3,732,258

LINEAR COPOLYMERS OF VINYLCYCLOHEXENE DIEPOXIDE AND 1,2 ALKYLENE OXIDES BY CATALYSIS WITH A TERTIARY-AMINE WATER SYSTEM

Gary L. Statton, Wallingford, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,045

Int. Cl. C08g *23/14*

U.S. Cl. 260—348 C 12 Claims

Liquid linear soluble copolymers of vinylcyclohexene diepoxide and 1,2-monoepoxides can be produced in good yield using a catalyst system comprising a tertiary amine and an active hydrogen-containing compound.

3,732,259

BENZOQUINONE ETHERS AND PROCESS FOR THEIR MANUFACTURE

Stefan Hari, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

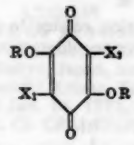
No Drawing. Filed July 15, 1969, Ser. No. 842,021

Claims priority, application Switzerland, July 29, 1968, 11,303/68

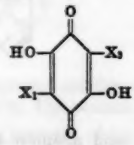
Int. Cl. C07c *49/64, 79/36, 147/06*

U.S. Cl. 260—396 R 11 Claims

A process for the manufacture of benzoquinones of the formula



in which R represents an alkyl or cycloalkyl residue, X_1 represents a hydrogen or halogen atom or an electronegative substituent and X_2 represents a halogen atom or an electronegative substituent, wherein a dihydroxybenzoquinone of the formula



is reacted with an orthoformic acid ester.

3,732,260

CORTICOID STEROID COMPOUNDS

Hans Jacob Fex and Knut Bertil Hogberg, Halsingborg, and Imre Konyves, Hittarp, Sweden, assignors to Aktiebolaget Leo, Halsingborg, Sweden

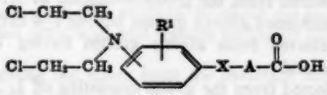
No Drawing. Filed Jan. 19, 1970, Ser. No. 4,067

Claims priority, application Great Britain, Jan. 23, 1969, 3,952/69

Int. Cl. C07c *169/34*

U.S. Cl. 260—397.45 30 Claims

New 21-esters of corticoid steroid hormones the esters having an antitumor activity, are prepared by reacting a reactive derivative of the general formula



wherein R^1 can be hydrogen, lower alkyl, halogen, or lower alkoxy, X can be oxygen, sulphur, or a monovalent carbon-to-carbon bond, A can be alkylene, aminoalkylene, or lower-alkanoyl aminoalkylene, and A together with X also can be a monovalent carbon-to-carbon bond, with a corticoid steroid.

3,732,261
STEROID COMPOUNDS
John R. Smythies, Birmingham, Ala., and Kenneth E. Eakins, London, England, assignors to Nelson Research & Development Company, Irvine, Calif.
No Drawing. Filed Dec. 3, 1971, Ser. No. 204,683
Int. Cl. C07c *169/34*
U.S. Cl. 260—397.4 **5 Claims**

The disclosure describes steroid compounds substituted in the 6 and 15 positions, and in the α-configuration, with —OH, —O and —OA where A is an alkyl group having from one to about seven carbon atoms. The disclosure also describes steroid compounds which contain a highly charged group at the 11 position. These compounds are useful as blockers of prostaglandins or adenosine 3', 5'-monophosphate (cyclic AMP) in humans or animals.

3,732,262
10-HYDRAZONO-3,7-DIALKYL-2,6-DECADIENOATES
Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.
No Drawing. Filed May 12, 1971, Ser. No. 142,818
Int. Cl. C07c *109/14, 69/66;* **A01n** *9/20*
U.S. Cl. 260—404.5 **11 Claims**

Novel hydrazono compounds prepared by the reaction of a hydrazine with an aliphatic unsaturated aldehyde which are useful for the control of insects.

3,732,263
METHOD FOR POLYMERIZING FATTY ACIDS
Lawrence U. Berman, Skokie, Ill., assignor to Kraftco Corporation, New York, N.Y.
No Drawing. Filed Sept. 16, 1970, Ser. No. 72,845
Int. Cl. C09f *7/06;* **C11c** *3/00*
U.S. Cl. 260—407 **4 Claims**

A method for polymerization of unsaturated fatty acids is provided. In the method, polymerization of unsaturated fatty acids is effected by heating unsaturated fatty acids in the presence of a particular neutral clay catalyst. The usual temperature range embraced is from about 225° C. to about 270° C. for a period of about one hour to about five hours at a pressure of from about 90 p.s.i.g. to about 160 p.s.i.g. Moisture is usually present in the reaction mixture in an amount of from about 2 to about 5 percent by weight of the reaction mixture.

3,732,264
3-ALKOXY-α,β-UNSATURATED ACIDS AND ESTERS
John W. Baum, Palo Alto, and Donald W. Erickson, Cupertino, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.
No Drawing. Filed Nov. 12, 1971, Ser. No. 198,418
Int. Cl. C07c *59/22, 69/66;* **A01n** *9/24*
U.S. Cl. 260—408 **16 Claims**

Novel aliphatic α,β-unsaturated esters and acids having a lower alkoxy group at C–3 and synthesis thereof, which are useful for the control of insects.

3,732,265
FLAME RETARDANTS FOR FLEXIBLE FOAMED PLASTIC
Gerald A. Roth, Palos Hills, Ill., assignor to Swift & Company, Chicago, Ill.
No Drawing. Filed July 30, 1969, Ser. No. 846,267
Int. Cl. C11c *3/00*
U.S. Cl. 260—408 **6 Claims**

Hydroxyl and halogen containing adducts obtained by reacting a hydroxy higher fatty acid ester and an aliphatic haloepoxide in the presence of an acid catalyst are produced and used to prepare flame resistant non-rigid polyurethane foams.

3,732,266
HYDROGENATION OF OILS
Frank A. Dudrow, Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.
Filed Apr. 8, 1970, Ser. No. 26,509
Int. Cl. C11c *3/12*
U.S. Cl. 260—409 **2 Claims**

A method and apparatus are provided for control of the temperature of a fluid reaction mass. Heat exchanger means in the reaction vessel contains a body of coolant which is vaporized to absorb heat. A closed coolant condensation system communicates with the heat exchanger means to remove heat as it is generated.

3,732,267
14-PHENYL-9,12-DIOXO-11-HYDROXYTETRADEC-13-ENOIC ACID AND SALT THEREOF
Masateru Miyano, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Continuation-in-part of application Ser. No. 799,965, Feb. 17, 1969. This application Oct. 7, 1971, Ser. No. 187,568
Int. Cl. C07c *65/20;* **C08h** *17/36*
U.S. Cl. 260—413 **3 Claims**

The condensation of dimethyl 3-oxoundecane-1,11-dioate with styrylglyoxal affords 14-phenyl-9,12-dioxo-11-hydroxytetradec-13-enoic acid. The instant compounds are useful as intermediates to prostanoic acid derivatives which exhibit anti-microbial, pepsin-inhibitory, hypotensive and smooth muscle-contracting properties.

3,732,268
MICROBIOLOGICAL PREPARATION OF OPTICALLY ACTIVE 9-OXO - 5(S)-HYDROXY-DECANOIC ACID AND THE LACTONE THEREOF
Julius Berger, Passaic, and Michael Rosenberger, Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Original application July 22, 1970, Ser. No. 57,371. Divided and this application Jan. 12, 1972, Ser. No. 217,294
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **1 Claim**

Optically active 9-oxo-5(S)-hydroxy-decanoic acid is prepared by selective microbiological reduction of 5,9-dioxo-decanoic acid. The product acid is converted to levorotatory 9-oxo-5(S)-hydroxy-decanoic acid lactone by treatment of the reaction medium with a strong mineral acid. The aforesaid lactone is useful as an intermediate in the total synthesis of medicinally valuable, optically active steroids.

3,732,269
METHOD OF MAKING HEXA-ALKYL DISTANNOXANES TOGETHER WITH TETRA-ALKYL TIN COMPOUNDS
Karl Rudolf Wehn and Eckhard Guderian, Kamen, Germany, assignors to Schering AG, Berlin and Bergkamen, Germany
No Drawing. Filed Nov. 2, 1971, Ser. No. 195,047
Claims priority, application Germany, Nov. 7, 1970, P 20 54 902.4
Int. Cl. C07f *7/22*
U.S. Cl. 260—429.7 **10 Claims**

A method for making a mixture of a hexa-alkyl distannoxane and a tetra-alkyl tin compound, from which mixture the products—which are useful as biocides—can be separately recovered, by reacting tin tetrachloride with an aluminum trialkyl in a mol ratio of 0.98:1 to 0.78:1 in ether, and then hydrolyzing the reaction product under alkaline conditions.

3,732,270

WERNER CHROMIUM COMPLEXES AND METHODS FOR THEIR PREPARATION

John Edwin Bride, Mentor, Ohio, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 19, 1971, Ser. No. 117,112

Int. Cl. C07f *11/00*

U.S. Cl. 260—438.5 C 9 Claims

A Werner complex composition has trivalent chromium atoms coordinated with acido groups and chlorine atoms. The acido groups are from saturated aliphatic dicarboxylic acids having less than six carbon atoms and that may contain hydroxyl groups, but not more than three hydroxyl groups. The complexes are characterized by a specific range for the ratio of both the chromium atoms to acido groups as well as chromium atoms to chlorine atoms. The complex composition is useful in preparing chromium plating baths that have a bright plating range that is desirably extended over a broad range for decorative chromium plate.

3,732,271

N-(THIO)DIAMIDES

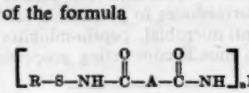
Kamel Boustany and John P. Vander Kooi, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed July 30, 1970, Ser. No. 59,719

Int. Cl. C07c *119/00*

U.S. Cl. 260—453 R 19 Claims

Diamides of the formula



are prepared by reacting a primary amine or diamine with N-thioimide. The diamides are inhibitors of premature vulcanization.

3,732,272

HERBICIDAL N,N-ALKYL ALKYLIMINOALKYL THIOCARBAMATES

Harry Tilles, El Cerrito, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,022

Int. Cl. C07c *155/08*

U.S. Cl. 260—455 A 12 Claims

Novel N,N-alkyl alkyliminoalkyl thiocarbamates are disclosed. The compounds are useful as herbicides.

3,732,273

α-METHYLOL-BENZOIN-SULPHONIC ACID ESTERS

Hans-Georg Heine, Krefeld, and Hans Rudolph and Hans-Joachim Kreuder, Krefeld-Bockum, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,862

Claims priority, application Germany, Apr. 18, 1969, P 19 19 678.2

Int. Cl. C07c *143/68*

U.S. Cl. 260—456 R 8 Claims

The invention provides novel α-methylol-benzoin-sulphonic acid esters which may be manufactured by reacting equivalent amounts of an α-hydroxy-methylbenzoin and a sulphonic acid ester chloride in the presence of a hydrogen chloride binding agent. The novel compounds decompose on irradiation with UV light under liberation of the corresponding sulphonic acid. Therefore, they are suitable for use as curing catalysts which can be activated by UV-rays for acid-curable resins or resin compositions.

3,732,274

NOVEL FLUOROALKYL CHLOROFORMATES AND A METHOD FOR THEIR PREPARATION

David Edward Young, Denville, Lowell Ray Anderson, Parsippany, Douglas Eugene Gould, Dover, and William Burke Fox, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Aug. 25, 1969, Ser. No. 852,896

The portion of the term of the patent subsequent to Dec. 14, 1988, has been disclaimed

Int. Cl. C07c *69/64*; A01n *9/12*

U.S. Cl. 260—463 10 Claims

Hydrogen containing fluoroalkyl chloroformates of formula:

$$R_3COC(O)Cl$$

wherein R is selected from the group consisting of hydrogen, alkyl, fluoroalkyl and aryl with the proviso that at least one R substituent is fluoroalkyl, and at least one carbon-hydrogen bond is present in the molecule. The alkyl and fluoroalkyl moieties may be made up of the same or a different number of carbon atoms and each may contain up to six carbons (lower alkyl), in a straight or branched chain structure and when R contains six carbon atoms, it may represent cyclic alkyl. These novel hydrogen containing fluorinated chloroformate products belong to a class of halogenated alkyl chloroformates, being useful as intermediates for the preparation of corresponding carbonate esters; peroxides; as polymerization catalysts and as insecticides and fumigants.

These novel hydrogen containing fluorinated chloroformates may be prepared by reacting the corresponding hypochlorite having the formula:

$$R_3COCl$$

wherein R is defined as above, with carbon monoxide at a temperature of up to 75° C., or higher. This method may also be used to prepare tertiary perfluorinated alkyl chloroformates having no hydrogen-to-carbon bonds in the molecule.

3,732,275

SEPARATING PHTHALONITRILES FROM REACTION GASES CONTAINING THE SAME

Rolf Platz, Mannheim, and Martin Decker, Gert Buerger, and Hanns-Helge Stechl, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 726,563, May 3, 1968. This application Dec. 30, 1970, Ser. No. 102,925

Int. Cl. C07c *121/56*

U.S. Cl. 260—465 B 4 Claims

An improved process for the recovery of phthalonitriles from hot reaction gases containing the same by contacting the hot reaction gases with a coolant which is at a temperature of from 40° to 200° C. and cooling them down at a rate of more than 350° C. per second, the coolant being water, benzonitrile or o-tolunitrile which from recycling contains 2 to 40% phthalonitriles. o-Phthalonitrile is suitable for the production of phthalocyanines which are valuable pigments; terephthalonitrile and isophthalonitriles can be reduced to the corresponding diamines which are starting materials for the manufacture of polyamides which can be used for the production of fibers.

3,732,276

HYDRODIMERIZATION PROCESS OF ACRYLIC COMPOUNDS

Cyrille Van Eygen, Boitsfort, and Antonin Hendrickx, Brussels, Belgium, assignors to UCB, Societe Anonyme, Saint-Gilles-lez-Brussels, Belgium

No Drawing. Filed July 5, 1966, Ser. No. 562,475
Claims priority, application Great Britain, July 7, 1965, 28,801/65
Int. Cl. C07c *121/26, 121/20, 121/16*
U.S. Cl. 260—465.8 A 6 Claims

The hydrodimerization of acrylic compounds is materially improved by effecting same in the presence of an alkali or alkaline earth metal amalgam in a medium of liquid consistency containing the acrylic compound(s), from 0.1 to 100 milliequivalents of acid per liter and at least one non-reactive amide.

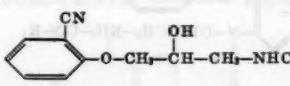
3,732,277

1-(2'-CYANO-PHENOXY)-2-HYDROXY-3-ETHYL-AMINO-PROPANE AND SALTS THEREOF

Herbert Köppe and Karl Zelle, Ingelheim am Rhein, and Werner Traunecker, Munster-Sarmsheim, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,749
Int. Cl. C07c *121/78*
U.S. Cl. 260—465 E 2 Claims

1-(2'-cyano-phenoxy) - 2 - hydroxy-3-ethylamino-propane of the formula



and non-toxic, pharmacologically acceptable acid addition salts thereof; the compounds are useful as β-adrenergic receptor blocking agents in warm-blooded animals.

3,732,278

ETHYL (4-TRIFLUOROMETHYL-2,3,5,6-TETRAFLUOROPHENYL) CYANOACETATE

William P. Norris, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Original application Apr. 24, 1968, Ser. No. 723,908. Divided and this application Dec. 2, 1970, Ser. No. 94,540
Int. Cl. C07c *121/66*
U.S. Cl. 260—465 D 1 Claim

A method for the preparation of new highly fluorinated p-xylylene monomers and polymers which have excellent chemical and thermal properties.

3,732,279

PREPARATION OF m-(β-CYANOETHOXY) BENZOIC ACID AND ESTERS THEREOF

Norio Kotera, Amagasaki, and Yoshitsugu Suzuki, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,924
Claims priority, application Japan, Mar. 10, 1970, 45/20,734
Int. Cl. C07c *121/02*
U.S. Cl. 260—465 D 7 Claims

m-(β-Cyanoethoxy)benzoic acid and the lower alkylesters thereof are obtained in a high yield by cyanoethylating m-hydroxybenzoic acid and the lower alkylesters thereof with acrylonitrile in the presence of a tertiary amine. Said products are highly useful as starting materials or intermediates for polyamides and polyesters.

3,732,280

PROCESS FOR SEPARATION OF TEREPHTHALONITRILE

Richard V. Norton, Wilmington, Del. (% Sun Oil Company, P.O. Box 426, Marcus Hook, Pa. 19061)

Continuation-in-part of abandoned application Ser. No. 89,776, Nov. 16, 1970. This application Jan. 7, 1972, Ser. No. 224,264
Int. Cl. C07c *121/54, 121/58*
U.S. Cl. 260—465 C 2 Claims

Process for separation of terephthalonitrile from its admixture with tolunitrile and xylene by the combined steps of (1) adding said mixture to hot xylene, withdrawing a portion of said hot xylene mixture, cooling said withdrawn portion to crystallize terephthalonitrile, filtering off said terephthalonitrile, and returning the filtrate to said hot xylene mixture; (2) removing and condensing vapors from said hot xylene mixture, chilling said condensate, filtering off terephthalonitrile, and combining it with terephthalonitrile obtained in step (1).

3,732,281

ACRYLONITRILE DIMERS

Julian Feldman and Bernard A. Saffer, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 271,463, Apr. 8, 1963, now abandoned. This application Nov. 26, 1971, Ser. No. 202,636
Int. Cl. C07c *121/36*
U.S. Cl. 260—465.8 D 1 Claim

2-methyleneglutaronitrile is prepared by the dimerization of acrylonitrile in the presence of a tertiary phosphine catalyst, in a solvent which is preferably acetonitrile.

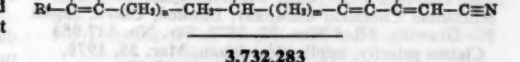
3,732,282

TRI-OLEFINIC ALIPHATIC NITRILES

Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Continuation-in-part of application Ser. No. 187,897, Oct. 8, 1971, which is a continuation-in-part of applications Ser. Nos. 111,650, 111,702, 111,765, 111,766, and 111,770, all Feb. 1, 1971, and all now abandoned, and Ser. No. 115,725, Feb. 16, 1971, now Patent No. 3,706,733. This application Nov. 8, 1971, Ser. No. 196,800
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.9 11 Claims

Aliphatic hydrocarbon tri-olefinic and aliphatic substituted di-olefinic acids, esters, aldehydes, ketones, thiolesters, alcohols, thiols, halides, nitriles, amines, amides and derivatives thereof, intermediates therefor, syntheses thereof, and the control of insects, one embodiment of which is represented by the following formula:



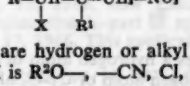
3,732,283

SUBSTITUTED NITROALKYL NITRATE AND PEROXYNITRATE

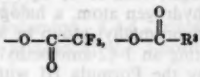
William M. Cummings, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed May 17, 1971, Ser. No. 144,212
Int. Cl. C07c *77/02*
U.S. Cl. 260—466 17 Claims

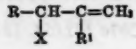
Nitroalkyl nitrate and peroxynitrates characterized by the formula:



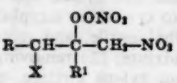
where R and R^1 are hydrogen or alkyl or from 1 to 10 carbons, where X is R^2O—, —CN, Cl, phenyl, —ONO_2,



where R^2 is alkyl of from 1 to 10 carbons or phenyl and R^3 is hydrogen, phenyl or alkyl of from 1 to 10 carbons, and where Y is $—OONO_2$ or $—ONO_2$, said nitroalkyl nitrates being prepared by first contacting a substituted alkene of the formula:



where R, R^1 and X are as heretofore defined with a mixture of dinitrogen tetroxide and oxygen to form substituted nitroalkyl peroxynitrate of the formula:



where R, R^1 and X are as heretofore defined and second contacting said peroxynitrate with a reducing agent to form said substituted nitroalkyl nitrate, the first and second contacting being conducted in the presence of inert liquid. The nitroalkyl nitrate final products of the invention are useful as fuel additives to increase power output of petroleum distillates such as gasoline and kerosene. Further, they are useful as intermediates in the preparation of surfactants, fuel and lubricant additives, insecticides, fungicides (e.g. controlling early blight in bean plants), pharmaceuticals and polymers.

3,732,284

PROCESS FOR THE PREPARATION OF β-CYCLOALKYLPROPIONIC ESTERS OF DIMETHYLAMINOETHANOL

Raymond Valette, Saulxier par Saulx-les-Chartreux, France, assignor to Les Laboratoires Albert Rolland, Paris, France

No Drawing. Filed Aug. 12, 1969, Ser. No. 849,509
Claims priority application Great Britain, Aug. 20, 1968, 39,875/68
Int. Cl. C07c *93/22, 67/02*
U.S. Cl. 260—468 R **7 Claims**

Therapeutically useful dimethylaminopropanol β-cycloalkylpropionate esters are prepared by reacting a methyl, ethyl, propyl or butyl cycloalkylpropionate ester with dimethylaminoethanol in a non-aqueous solvent.

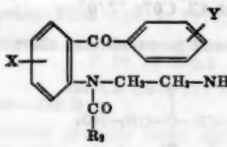
3,732,285

NOVEL AMINOBENZOPHENONE DERIVATIVES

Hisao Yamamoto, Nishinomiya, Shigeho Inaba, Takarazuka, Tadashi Okamoto, Toshiyuki Hirohashi, Ashiya, Kikuo Ishizumi, Ikeda, Michihiro Yamamoto, Toyonaka, Isamu Maruyama, Minoo, Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

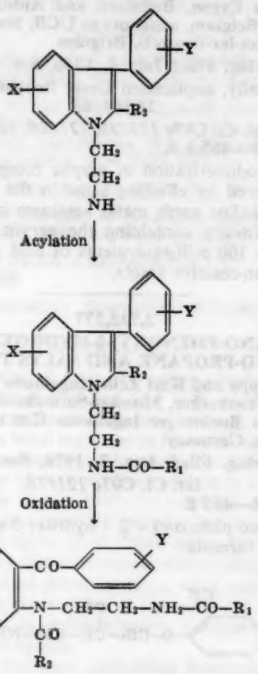
No Drawing. Filed Mar. 22, 1971, Ser. No. 127,053
Claims priority, application Japan, Mar. 25, 1970, 45/25,546; Mar. 26, 1970, 45/25,674
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **1 Claim**

Novel aminobenzophenone derivative represented by the Formula I,



(I)

wherein R_1 signifies a hydrogen atom or an alkoxy group; R_2 signifies a hydrogen atom or C_1–C_3 alkyl group; X and Y each signify a hydrogen atom, a halogen atom, C_1–C_3 alkyl group, a trifluoromethyl group or a nitro group, is prepared by acylating an 1-(2-aminoethyl)-indole derivative represented by the Formula III with a formic acid derivative, then oxidizing the resulting 1-(N-acylaminoethyl)-indole derivative represented by the Formula II with an oxidizing agent by the following reaction schema:



(III) (II) (I)

The aminobenzophenone derivatives of the Formula II have central nervous controlling effects and are useful intermediates for preparing benzodiazepine derivatives, which are known as remarkably effe ive transquilizers, muscle relaxants, anticonvulsants and hypnotics.

3,732,286

COMPOSITIONS COMPRISING AN EPOXY RESIN, DICYANIAMIDE AND AN ACYLGUANIDINE

Pyong-Nae Son, Akron, and Carl D. Weber, Copley, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,524
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EN **5 Claims**

Mixtures storable at room temperature for periods up to 30 days, yet which cure quickly at moderately elevated temperatures and are suitable for the manufacture of shaped structures, coatings and adhesive bonds, have been prepared comprising an epoxy resin, dicyaniamide as a curing agent, and an acylguanidine as an accelerator for the cure.

3,732,287

BISMONOCARBOXYLIC ESTERS OF 3-FORMYLBUTANEDIOL-1,2

Walter Himmele, Walldorf, and Werner Aquila, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 1, 1970, Ser. No. 68,785
Claims priority, application Germany, Sept. 9, 1969, P 19 45 479.6
Int. Cl. C07c *69/78, 45/08, 175/00*
U.S. Cl. 260—476 R **3 Claims**

Bismonocarboxylic esters of 3-formylbutanediol-1,2 and their production by reaction of bismonocarboxylic

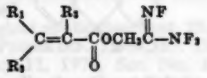
esters of butene-1-diol-3,4 with carbon monoxide and hydrogen in the presence of carbonyl complexes of rhodium at elevated temperature and superatmospheric pressure. Bismonocarboxylic esters of 3-formylbutanediol-1,2 are used for the production of β-formylcrotyl esters which are valuable starting materials for the production of vitamin A esters.

3,732,288
DIFLUOROAMINO COMPOUNDS

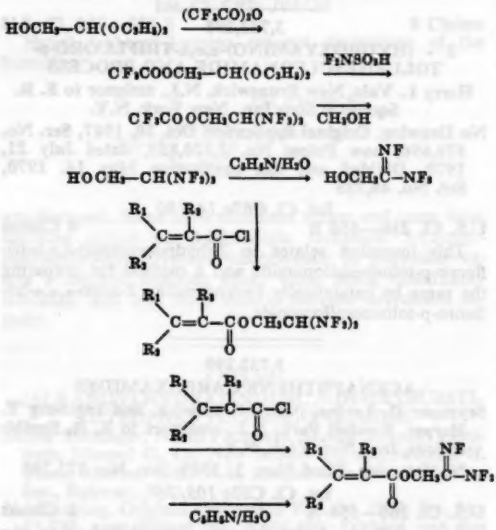
Clifford L. Coon, Fremont, Marion E. Hill, Palo Alto, and Donald L. Ross, Menlo Park, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Mar. 10 ,1970, Ser. No. 23,106
Int. Cl. C07c *69/54, 69/62*
U.S. Cl. 260—486 H **8 Claims**

Compounds of the formula



are produced by the following reaction sequence:



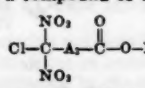
where R_1, R_2 and R_3 vary independently and represent H and lower alkyl. These compounds are used to produce polymers which are used in propellant binders.

3,732,289
HALO DINITRO-ALKANOIC ACID ESTERS OF ALKANEDIOLS

Marvin H. Gold, Sacramento, and Henry J. Marcus, West Covina, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

No Drawing. Application Jan. 3, 1967, Ser. No. 616,147, which is a division of application Ser. No. 326,286, Nov. 26, 1963. Divided and this application Apr. 23, 1970, Ser. No. 31,382
Int. Cl. C07c *79/40*
U.S. Cl. 260—487 **2 Claims**

A process for controlling the growth of bacteria and fungus comprising treating the bacteria or fungus with an effective amount of a compound of the formula:



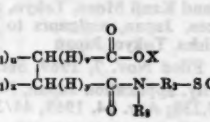
wherein A_2 is lower alkylene and R_2 is lower alkyl.

3,732,290
MONOAMIDE HYDROCARBYL SULFONIC ACID SALTS OF HYDROCARBYL SUCCINIC ACID AS DETERGENT ACTIVES

Mitchell Danzik, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Dec. 17, 1969, Ser. No. 885,977
Int. Cl. C07c *143/52, 143/12*
U.S. Cl. 260—507 R **9 Claims**

Detergent active materials comprising monoamide hydrocarbyl sulfonic acid salts of hydrocarbyl succinic acid of the formula



in which u, v, x and y are 0 or 1, the sum of u and v is 1, the sum of x and y is 1, the sum of u and x is 1, the sum of v and y is 1, R_1 is a hydrocarbyl group of 8 to 30 carbon atoms; R_2 is a hydrocarbylene group of 1 to 8 carbon atoms; R_3 is H, a hydrocarbyl group of 1 to 8 carbon atoms, or $—R_2—SO_3Y$; X is H or Y; and Y is a water soluble salt forming cation.

3,732,291
PREPARATION OF FLUOROAMMONIUM SALTS AND THEIR APPLICATIONS

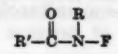
Vytautas Grakauskas, Arcadia, and Allen H. Remanick, Pasadena, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,438
Int. Cl. C07c *143/02*
U.S. Cl. 260—513 R **7 Claims**

This patent describes novel N-fluoroammonium salts having the general formula

$$RNH_2F^{\oplus}SO_3Y^{\ominus}$$

wherein R is selected from the group consisting of hydrogen, alkyl, substituted alkyl, cyclic and heterocyclic radicals, and Y is a lower alkyl radical. This patent further describes the method of preparing the above compounds by reacting a compound of the formula



with an alkanesulfonic acid wherein in the above formula R is defined above, and R' is selected from the group consisting of alkyl, alkoxy and amino.

3,732,292
INDENYL COMPOUNDS

David F. Hinkley, Plainfield, and John B. Conn, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed May 1, 1970, Ser. No. 33,890
Int. Cl. C07c *147/00*
U.S. Cl. 260—515 A **3 Claims**

5-fluoro-2-methyl - 1 - (4'-methylsulfinylbenzylidene)-3-indenyl acetic acid is prepared by processes that form the 3-acetic acid side chain as the final step.

3,732,293
IODINATED BIS(AMINOBENZOIC ACIDS) AND ESTERS THEREOF

James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 713,302, Mar. 15, 1968, now Patent No. 3,542,861, which is a continuation-in-part of application Ser. No. 550,605, May 17, 1966. This application Nov. 13, 1969, Ser. No. 876,615
Int. Cl. C07c *147/12, 147/14, 149/34*
U.S. Cl. 260—516 **8 Claims**

Bis(3 - carbonylamino - 2,4,6 - triiodo - 5 - substituted-benzoic acids) bridged at the 3-position by an oxygen

or sulfur interrupted alkylene chain, useful as intravenous cholecystographic agents, are prepared by reaction of a 3-amino-5-substituted-2,4,6-triiodobenzoic acid with the appropriate dibasic acid dihalide.

3,732,294

AMINOACETYL ANTHRANILIC ACIDS AND PROCESS FOR PRODUCTION THEREOF

Minoru Shindo and Kanji Moro, Tokyo, and Teizo Shinozaki, Chiba-ken, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Nov. 7, 1969, Ser. No. 874,985
Claims priority, application Japan, Nov. 15, 1968, 43/83,238; Apr. 24, 1969, 44/31,250
Int. Cl. C07c *103/18*
U.S. Cl. 260—518 A 7 Claims

The known 7-chloro-1,3-dihydro-1-methyl-5-phenyl-2H-1,4-benzodiazepin-2-one which was found to be pharmacologically effective in neuro-psychic disorders is prepared easily and in high yield by an improved process comprising the reaction of a novel intermediate, N-aminoacetyl-5-chloro-N-methylanthranilic acid, with phosphorus pentachloride followed by reacting with benzene in the presence of aluminum chloride, the intermediate which is also found to have valuable pharmacological activities being, in turn, prepared by the reaction of 5-chloro-N-methyl-N-phthalimidoacetylanthranilic acid with hydrazine.

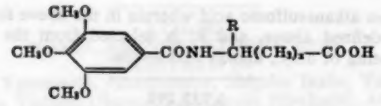
3,732,295

TRIMETHOXYBENZOYL-AMINOALKANOIC ACIDS

Franco Dompe', Milan, Italy, assignor to Dompe' Farmaceutici S.p.A., Milan, Italy

No Drawing. Filed Jan. 28, 1970, Ser. No. 6,585
Claims priority, application Italy, Nov. 25, 1969, 24,863/69
Int. Cl. C07c *103/12*
U.S. Cl. 260—519 3 Claims

Trimethoxybenzoyl-aminoalkanoic acids of general formula



wherein x is an integer from 1 to 5 and R is an alkyl group having 1 to 3 carbon atoms and their derivatives are prepared by reacting 3,4,5-trimethoxybenzoic acid chloride with an aminoalkanoic acid at a temperature between −5 and +5° C. The compounds are useful in the treatment of heart infarct.

3,732,296

PREPARATION OF AROMATIC ACIDS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 5, 1971, Ser. No. 140,626
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 9 Claims

Aromatic acids such as benzoic acid may be prepared by treating an alkylaromatic compound such as toluene in an oxygen-containing gas in the presence of a catalyst comprising a mixture of an iron halide and a thallium-containing compound at oxidation conditions, the use of such a catalyst resulting in the recovery of improved yields of the desired product.

3,732,297

BIS(ACID HALIDE) DIHYDROANTHRACENES

Desmond Sheehan, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Application Oct. 11, 1968, Ser. No. 766,989, which is a division of application Ser. No. 489,748, Sept. 23, 1965, now Patent No. 3,470,103. Divided and this application Dec. 16, 1970, Ser. No. 98,943
Int. Cl. C07c *63/46*
U.S. Cl. 260—544 M 2 Claims

New 9,10-substituted anthracenes which are useful in a chemiluminescent reaction, having the structure

wherein X is a halo group and R is a phenyl group.

3,732,298

2 - (HYDROXYAMINO)-α,α,α-TRIFLUORO-p-TOLUENESULFONAMIDE AND PROCESS

Harry L. Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons Inc., New York, N.Y.

No Drawing. Original application Oct. 20, 1967, Ser. No. 676,696, now Patent No. 3,520,883, dated July 21, 1970. Divided and this application May 14, 1970, Ser. No. 48,725
Int. Cl. C07c *143/80*
U.S. Cl. 260—556 B 4 Claims

This invention relates to 2-(hydroxyamino)-α,α,α-trifluoro-p-toluenesulfonamide and a method for preparing the same by catalytically hydrogenating 2-nitro-α,α,α-trifluoro-p-toluenesulfonamide.

3,732,299

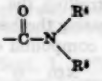
ACENAPHTHENE CARBOXAMIDES

Seymour D. Levine, North Brunswick, and Ingeborg T. Harper, Kendall Park, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

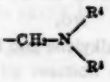
No Drawing. Filed Nov. 3, 1969, Ser. No. 873,700
Int. Cl. C07c *103/76*
U.S. Cl. 260—558 A 2 Claims

Acenaphthene derivatives are provided having the general structure

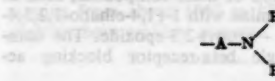
wherein at least one of R^1 and R^2 are alkyl and the other can be hydrogen; Z is —CN, —$COOR^3$ (wherein R^3 is hydrogen or a hydrocarbon radical or halophenyl), —CH_2OH,



or



and Y is hydrogen or



wherein R^4 to R^7 are hydrogen or a hydrocarbon radical, A is alkylene, and X is hydrogen, halogen, alkyl, alkoxy, haloalkyl or haloalkoxy. These compounds possess anti-inflammatory activity.

3,732,300

PHENYLAMINOETHANOL DERIVATIVES

Lawrence H. C. Lunts and Paul Toon, Bethnal Green, England, assignors to Allen and Hanburys Limited, London, England

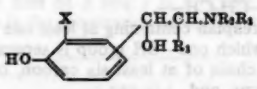
No Drawing. Original application Sept. 20, 1967, Ser. No. 669,263, now Patent No. 3,644,353. Divided and this application May 11, 1971, Ser. No. 142,367

Claims priority, application Great Britain, Sept. 23, 1966, 42,590/66

Int. Cl. C07c *103/26*

U.S. Cl. 260—559 S **8 Claims**

Novel 1-phenyl-2-amino ethanol derivatives of the formula:



are disclosed. Some have stimulant action and some have blocking action on β-adrenergic receptors. 5-(2-tert.-butylamino-hydroxyethyl)-salicylamide in particular exerts a marked blocking effect while being remarkably non-toxic and free from central nervous depressant activity.

3,732,301

α-(ALKANOYLHYDRAZINO)-β-(3,4-DI-OXYSUBSTITUTEDPHENYL) PROPIONAMIDES

Meyer Sletzinger, North Plainfield, Sandor Karady, Elizabeth, Manuel G. Ly, New Brunswick, and Seemon H. Pines, Murray Hill, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Feb. 24, 1970, Ser. No. 13,770, now Patent No. 3,676,480. Divided and this application June 24, 1971, Ser. No. 156,490

Int. Cl. C07c *103/19*

U.S. Cl. 260—559 H **1 Claim**

Novel L-α-acylhydrazino-β-phenyl-propionitrile compounds useful as intermediates in the production of L-α-hydrazino-β-phenyl-propionic acids. Also included are processes for preparing the novel compounds of this invention by aminating L-α-acylamido-β-phenyl-propionitrile and processes for hydrolyzing the novel compounds of this invention to form L-α-hydrazino-β-phenyl-propionic acid compounds.

3,732,302

PROCESS FOR PRODUCING METHACRYLAMIDE

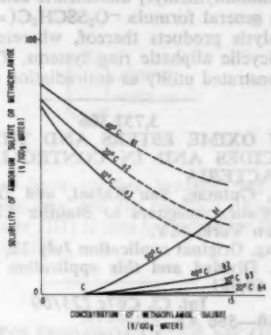
Kazumi Takagi and Teruo Matsuda, Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka-shi, Osaka-fu, Japan

Filed Apr. 30, 1970, Ser. No. 33,332

Int. Cl. C07c *103/00*

U.S. Cl. 260—561 N **7 Claims**

A process for producing methacrylamide of high purity which comprises neutralizing an aqueous solution of methacrylamide sulfate, obtained by the reaction between acetone cyanohydrin and sulfuric acid in a conventional manner, with ammonia to a neutralization degree of below 95%, collecting the crude methacrylamide precipitated upon cooling, and purifying the collected crude



methacrylamide with water or with an aqueous solution of ammonia.

3,732,303

PROCESS FOR THE PREPARATION OF 2-OXIMINO-6-NITRO HEXANAMIDE

Robert Fuhrmann, Morris Plains; Fred W. Koff, Clifton, and John Pisanchyn, Morristown, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Oct. 14, 1971, Ser. No. 189,365

Int. Cl. C07c *103/00*

U.S. Cl. 260—561 A **2 Claims**

2-oximino-6-nitro hexanamide is suitably purified by recrystallization from a solvent selected from the group consisting of (a) C_1 to C_3 dialkyl ethers of ethylene glycol, and (b) C_2 to C_5 halogenated alkanes having a Cl/C atom ratio ranging from about 1:1 to 1:3.

3,732,304

NOVEL COMPOSITION

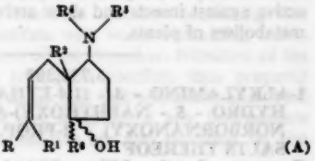
John D. Diekman, Menlo Park, and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed May 10, 1971, Ser. No. 142,076

Int. Cl. C07c *87/02*

U.S. Cl. 260—563 R **11 Claims**

Novel amino cyclopentane compounds of Formula A, prepared from a cyclopentane-1,3-dione, useful for the control of insects



(A)

wherein each of R, R^1, R^3, R^4, and R^5 is hydrogen or lower alkyl, R and R^1 together form a cycloalkyl ring, and R^2 is methyl or ethyl.

3,732,305

S-SUBSTITUTED THIOSULFURIC ACID DERIVATIVES AND PREPARATION THEREOF

Ludwig Bauer, Wilmette, Ill., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Mar. 3, 1970, Ser. No. 16,240

Int. Cl. C07c *129/00*

U.S. Cl. 260—564 R **1 Claim**

This invention relates to antiradiation compounds comprising a molecule which includes a component with antiradiation properties linked to a component with substantial lipid solubility. There are also described seven new

compounds, illustrative of this new type of antiradiation compound. The seven compounds are S-[(N-substituted carboxamidinium)methyl] thiosulfuric acids (Bunte salts) having the general formula $^{-}O_3SSCH_2C(=NH_2+)NHR$ and hydrolysis products thereof, wherein R represents bi- and tricyclic aliphatic ring systems. The compounds have demonstrated utility as antiradiation agents.

3,732,306

CERTAIN OXIME ESTERS AND THEIR USE AS ACARICIDES AND IN CONTROLLING FUNGI AND BACTERIA

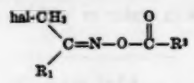
Arnold D. Gutman, San Rafael, and Don R. Baker, Pinole, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application July 22, 1968, Ser. No. 746,309. Divided and this application July 2, 1970, Ser. No. 60,961

Int. Cl. C07c *123/00*

U.S. Cl. 260—566 AE **12 Claims**

Compounds having the formula



in which hal is chlorine, bromine or iodine, R^1 is (1) hydrogen, (2) lower alkyl, (3) aryl, (4) nuclear substituted derivatives thereof in which the substituents are halogen, nitro, lower alkoxy, lower alkyl, or cyano and (5) haloalkyl, and R^2 is (1) aryl, (2) nuclear substituted derivatives thereof in which the substituents are halogen, cyano, nitro, lower alkoxy, or lower alkyl, (3) styryl, (4) nuclear substituted styryl, in which the substituents are halogen, cyano, nitro, lower alkoxy or lower alkyl, (5) benzyl, (6) nuclear substituted benzyl in which said substituents are halogen, cyano, nitro, lower alkoxy or lower alkyl, (7) phenethyl, (8) nuclear substituted phenethyl in which the substituents are halogen, cyano, nitro, lower alkoxy, or lower alkyl, (9) cycloalkyl having 3 to 6 carbon atoms, and (10) furyl.

3,732,307

BENZOPHENONE HYDRAZONES CONTAINING PERFLUOROALKYL, PERFLUOROALKOXY, AND PERFLUOROALKYLTHIO SUBSTITUENTS

William J. Middleton, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Sept. 24, 1970, Ser. No. 75,236

Int. Cl. C07c *109/16*

U.S. Cl. 260—566 B **9 Claims**

Fluorinated benzophenone hydrazones are biologically active against insects and show activity in influencing the metabolism of plants.

3,732,308

1-ALKYLAMINO - 3 - (1,4-ETHANO-1,2,3,4-TETRAHYDRO - 5 - NAPHTHOXY)-AND - 3-(5-BENZONORBORNANOXY) - 2-PROPANOLS AND THE SALTS THEREOF

Francesco Lauria, Milan, Vittorio Vecchietti, Pavia, Mario Bergamaschi, Monza, Milan, and Raffaele Tommasini, Milan, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

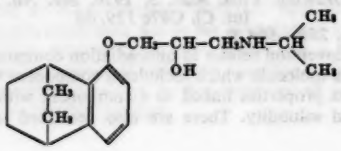
No Drawing. Filed July 24, 1970, Ser. No. 58,165

Claims priority, application Italy, July 30, 1969, 20,278/69

Int. Cl. C07c *93/06*

U.S. Cl. 260—570.7 **8 Claims**

Basic compounds are disclosed, as for instance of the formula:



and methods of preparation of these compounds, such as the reaction of isopropylamine with 1-(1,4-ethano-1,2,3,4-tetrahydro-5-naphthoxy) - propyl-2,3-epoxide. The compounds possess adrenergic beta-receptor blocking activity.

3,732,309

POLYEPOXIDE-POLYMERCAPTAN-AMINE ADDUCTS

Edward William Garnish, Saffron Walden, and Clifford George Haskins, Haslingfield, England, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Dec. 30, 1969, Ser. No. 889,311

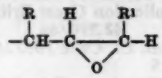
Claims priority, application Great Britain, Jan. 2, 1969, 402/69

Int. Cl. C07c *87/00, 87/14, 87/20*

U.S. Cl. 260—583 P **16 Claims**

As curing agents for epoxy resins adducts obtained by reaction of

(a) a polyepoxide having, per average molecule, more than one 1,2-epoxide group of the formula



(I)

directly attached to oxygen, to nitrogen, or to sulphur, where R and R^1 each represent hydrogen or together represent $—CH_2CH_2—$,

(b) a polymercaptan containing at least one pair of —SH groups in which one—SH group is separated from the other by a chain of at least six carbon, or carbon and oxygen, atoms, and

(c) an amine.

3,732,310

MERCAPTOPROPYLAMMONIUM DERIVATIVES

Ludwig Konrad Huber, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Filed July 19, 1971, Ser. No. 168,787

Int. Cl. C07c *149/24*

U.S. Cl. 260—583 B **3 Claims**

3-mercaptopropylammonium derivatives of the formula $(HSCH_2CH_2CH_2NR^1R^2R^3)X$ where R^1 is NH_2, R^2 is lower alkyl, R^3 is alkyl having one to 16 carbon atoms, and X is an anion. The compounds are useful as bactericides and fungicides.

3,732,311

PRODUCTION OF N-ALKYLATED AMINES

Seymour Baron, Wayne, N.J., assignor to Fine Organics, Inc., Lodi, N.J.

No Drawing. Filed Feb. 24, 1970, Ser. No. 13,793

Int. Cl. C07c *85/06*

U.S. Cl. 260—583 R **6 Claims**

The invention enables production of N-alkylated amines without the use of high pressures, and with high recovery, by continuous single-step reaction of an alcohol with either ammonia or a primary or secondary amine, in vapor phase, through the discovery that thorium sulfate, used as a catalyst for the first time in said reaction, enables discard of high pressures, reaction at atmospheric pressure or thereabout, and the use of simple equipment and low labor cost.

3,732,312

PROCESS FOR PREPARING ALIPHATIC AMINES

Zdzislaw J. Dudzinski, Clifton, N.J., assignor to Millmaster Onyx Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 411, Jan. 2, 1970, which is a division of application Ser. No. 636,664, May 8, 1967. This application Nov. 10, 1970, Ser. No. 88,520

The portion of the term of the patent subsequent to Apr. 1, 1986, has been disclaimed

Int. Cl. C07c *85/04*

U.S. Cl. 260—584 R **5 Claims**

Tertiary aliphatic amines are prepared by the reaction of 1-chloroalkanes or 1-bromoalkanes with secondary

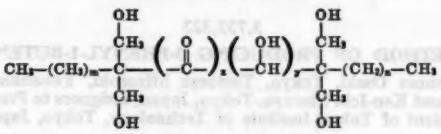
alkylolamines in a solventless environment at a temperature at least as high as room temperature, but preferably ranging from about 100° to 170° C., and at ambient or slightly above ambient pressure.

3,732,313
HIGH MOLECULAR WEIGHT POLYOLS

Samuel H. Sharman, Kensington, and Mitchell Danzik, Pinole, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Original application Aug. 28, 1970, Ser. No. 68,030, now Patent No. 3,646,100. Divided and this application Sept. 27, 1971, Ser. No. 184,246
Int. Cl. C07c 49/18
U.S. Cl. 260—594 4 Claims

High molecular weight polyols of the formula:



in which m and n are integers from 0 to 40 and the sum of m and n is from 15 to 40, x and y are integers from 0 to 1 and the sum of x and y is 1. These are useful as intermediates in the preparation of detergents.

3,732,314
PREPARATION OF AROMATIC ALDEHYDES

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,947
Int. Cl. C07c 45/02
U.S. Cl. 260—599 7 Claims

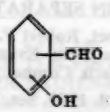
Aromatic aldehydes are prepared by treating an alkyl substituted aromatic hydrocarbon with an oxygen containing gas in the presence of an alkanol and a catalyst system comprising one or more metal salts.

3,732,315
PRODUCTION OF AROMATIC HYDROXY-ALDEHYDES

Herwig Hoffmann, Frankenthal, and Joachim Datow and Gotthilf Wenner, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Rhineland-Pfalz, Germany

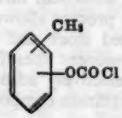
No Drawing. Filed May 13, 1970, Ser. No. 37,038
Int. Cl. C07c 45/00
U.S. Cl. 260—600 2 Claims

A process for the production of an aromatic hydroxy-aldehyde which may contain inert substituents and which has the general formula:



(I)

and which may have another benzene ring condensed onto the benzene ring, wherein an aromatic methylchloroformic acid ester which may contain inert substituents and which has the general formula:



(II)

and which may have another benzene ring condensed onto the benzene ring is first chlorinated to form a dichloromethylchloroformic ester which may contain inert substituents, which has the general formula:

(III)

and which may have another benzene ring condensed onto the benzene ring, and the resultant dichloromethylchloroformic ester (III) is then hydrolyzed to the aromatic hydroxyaldehyde (I).

3,732,316
PROCESS FOR PRODUCING METHYL PHOSPHINE OXIDES

Kingso Chingtsung Lin, Newark, Ohio, assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Filed Nov. 12, 1970, Ser. No. 89,103
Int. Cl. C07f 9/50
U.S. Cl. 260—606.5 P 5 Claims

Methyl phosphine oxides are prepared by thermal isomerization of the corresponding hydroxymethyl phosphines. The products find utility as fire retardant additives for organic polymers such as polyurethane foams and polyesters, and as intermediates for the production of surfactants, plasticizers, fire retardant polymers, and generally as oxidation stabilizers for use in lubricating oils, hydraulic fluids and organic polymers.

3,732,317
HYDROXYARYL THIOETHERS

Kurt H. Pilgram, Modesto, Calif., Dirk Medema, Amsterdam, Netherlands, and Samuel B. Soloway and George W. Gaertner, Jr., Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 14, 1970, Ser. No. 72,163
Int. Cl. C07c 149/46
U.S. Cl. 260—607 B 8 Claims

Hydroxyaryl thioethers are prepared by first preparing a phenyl sulfonium bisulfate—either directly by reacting a phenol with dimethyl sulfoxide in sulfuric acid or stepwise by reacting an organic sulfide with chlorine in sulfuric acid to form a chloro-sulfonium bisulfate and reacting this crude reaction mixture with a phenol—then reacting the crude reaction mixture containing the phenyl sulfonium bisulfate with water containing halide ions to effect formation of the thioether. Nitration of the intermediate phenyl sulfonium bisulfate thus prepared can be effected using nitric acid and optionally additional sulfuric acid without the isolating of any intermediate products. Novel intermediates are also prepared via this method.

3,732,318
α-CHLOROSULFOXIDES AND PROCESS FOR PREPARATION THEREOF

Shinobu Iriuchijima and Genichi Tsuchihashi, Tokyo, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

No Drawing. Filed Feb. 24, 1971, Ser. No. 118,554
Claims priority, application Japan, Mar. 7, 1970, 45/19,213
Int. Cl. C07c 147/00
U.S. Cl. 260—607 R 4 Claims

A new process for the production of α-chlorosulfoxides is described. Sulfoxides are chlorinated with chlorine gas in the presence of pyridine or its derivatives. The process

yield α-chlorosulfoxides economically and in a high yield. These compounds are useful as medicines and agricultural chemicals.

3,732,319

FORMATION OF T-BUTYL ETHER FROM METHYLAL

John O. Turner, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Sept. 4, 1970, Ser. No. 69,966

Int. Cl. C07c *43/04*

U.S. Cl. 260—614 R 1 Claim

Compounds such as dimethoxymethane, diethoxymethane or diisopropoxymethane may be converted to the corresponding t-butyl ether by reacting the same with t-butyl alcohol in the presence of an acidic catalyst such as sulfuric acid or certain acidic ion exchange resins or mole sieves.

3,732,320

PROCESS FOR PURIFYING ETHYLENE GLYCOL

Fred Austin Ford, Lake Charles, La., assignor to Cities Service Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 625,902, Mar. 6, 1967, which is a continuation-in-part of application Ser. No. 483,854, Aug. 30, 1965. This application Nov. 18, 1969, Ser. No. 871,687

Int. Cl. C07c *29/24*; C08g *17/06*

U.S. Cl. 260—637 R 8 Claims

A process for reducing the iron content of ethylene glycol by treatment with a cation exchange resin operating in the acid cycle. Products can be obtained which meet fiber grade glycol specifications as to both iron content and titratable acidity.

3,732,321

PROCESS FOR MAKING ALPHA-HALOALKENYL-AROMATICS

Charles F. Raley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

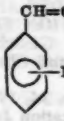
No Drawing. Continuation-in-part of application Ser. No. 691,689, Dec. 19, 1967. This application Mar. 13, 1970, Ser. No. 19,466

Int. Cl. C07c *25/28*

U.S. Cl. 260—651 R 1 Claim

Alpha-haloalkenylaromatics having the formula

are made by halogenating their corresponding alkenylaromatics having the formula



at a temperature between 300° and 700° C. for a time sufficient to produce the alpha-haloalkenylaromatic wherein each R and R' independently is any group inert under the reaction conditions, X is bromine or chlorine and *n* is an integer of from 0 to 5 inclusive.

3,732,322

PROCESS FOR THE PRODUCTION OF CHLOROETHYLENES

Takeo Kawaguchi, Reiji Saito, Sanpei Watanabe, and Yoshitaka Suzuki, Minato-ku, Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Minato-ku, Tokyo, Japan

No Drawing. Filed Aug. 19, 1969, Ser. No. 851,467

Int. Cl. C07c *21/00*

U.S. Cl. 260—654 D 1 Claim

Chloroethylenes, trichloroethylene, tetrachloroethylene, etc. are prepared in a high yield by pyrolysis, in vapor phase, of tetrachloroethane, pentachloroethane or mixtures thereof.

No carbon is seen to be by-produced.

3,732,323

METHOD OF PRODUCING 3-PHENYL-1-BUTENE

Atsumu Osaki, Tokyo, Tsutomu Mizoroki, Yokohama, and Ken-Ichi Maruya, Tokyo, Japan, assignors to President of Tokyo Institute of Technology, Tokyo, Japan

No Drawing. Filed Mar. 10, 1972, Ser. No. 233,778

Claims priority, application Japan, July 28, 1971, 46/56,650

Int. Cl. C07c *3/18*

U.S. Cl. 260—668 B 8 Claims

A method of selectively producing 3-phenyl-1-butene by codimerization of styrene with ethylene in the presence of boron trihalide and δ-aryl nickel(II) halide.

3,732,324

PROCESS FOR PRODUCING OIL-SOLUBLE SULFONATE FEEDSTOCK

Stephen E. McGuire and Carl D. Kennedy, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Apr. 2, 1971, Ser. No. 130,832

Int. Cl. C07c *3/56*

U.S. Cl. 260—671 G 14 Claims

An olefinic material containing from about 20 to about 36 carbon atoms is contacted with an arene compound in the presence of a catalyst system which includes a complex of aluminum chloride and nitromethane to thereby alkylate the arene compound. The product is fractionated to yield an alkylate having a boiling point of at least 200° C. at 20 mm. Hg pressure, which alkylate is useful as a feedstock for producing oil-soluble sulfonates.

3,732,325

HYDROCARBON SEPARATION PROCESS

Joe M. Pharis, Lockport, Robert F. Zabransky, Hinsdale, and Donald B. Broughton, Evanston, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 28, 1970, Ser. No. 101,676

Int. Cl. C07c *7/12*

U.S. Cl. 260—674 SA 8 Claims

A process for the separation of aromatic hydrocarbons which process comprises the adsorption of selected feed components followed by desorption of selected feed components from a solid adsorbent through the use of a desorbent material. The process allows the adsorbent which has just contacted feed stock and which selectively adsorbs a selected component therefrom to be contacted with a quantity of selectively adsorbed feed component to remove undesired raffinate components which are either

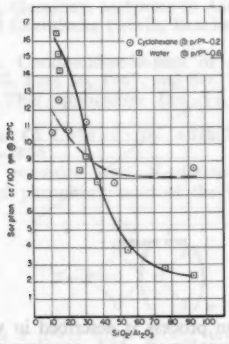
adsorbed by the adsorbent or present within the interstitial void spaces between the adsorbent particles prior to recovery of the extract material in a desorption step. The selectively adsorbed feed component can be taken from either a product extract stream or directly from the portion of the adsorbent in which the desorption step takes place.

3,732,326

SELECTIVE SORPTION OF LESS POLAR MOLECULES WITH CRYSTALLINE ZEOLITES OF HIGH SILICA/ALUMINA RATIO

Nai Yuen Chen, Titusville, N.J., assignor to Mobil Oil Corporation

Filed May 19, 1970, Ser. No. 38,811
Int. Cl. C10g *25/04*
U.S. Cl. 260—676 MS **10 Claims**



A method of selectively sorbing a compound of low polarity in admixture with a compound of the same or greater polarity which comprises passing the mixture over a crystalline aluminosilicate having a silica/alumina mole ratio of at least 35.

3,732,327

OXIDATIVE-DEHYDROGENATION CATALYSTS

Emory W. Pitzer, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed June 4, 1971, Ser. No. 150,235
Int. Cl. C07c *11/12*
U.S. Cl. 260—680 E **11 Claims**

The properties of a lithium-tin-phosphorous catalyst active for the oxidative dehydrogenation of hydrocarbons are improved by the deposition of oxides of aluminum and calcium on the catalyst.

3,732,328

PROCESS FOR THE PRODUCTION OF OCTADIENES

Donald Wright, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Oct. 8, 1970, Ser. No. 79,323
Claims priority, application Great Britain, Oct. 17, 1969, 51,151/69; Apr. 28, 1970, 20,368/70; July 27, 1970, 36,198/70
Int. Cl. C07c *11/12*
U.S. Cl. 260—680 B **6 Claims**

A process for the production of an octadiene selected from the group consisting of octa-1,6-diene, octa-1,7-diene, monomethylocta-1,6-diene, monomethylocta-1,7-diene, dimethylocta-1,6-diene and dimethylocta-1,7-diene which comprises contacting butadiene and/or isoprene at a temperature of 20 to 200° C. with a 10^{-1} to 10^{-5} molar concentration of a platinum, palladium, or ruthenium compound selected from the group consisting of halides, alkanoates containing up to 6 carbon atoms, acetylacetonates, bisbenzonitrile palladium (II) and lithium palladous chloride, in a polar solvent and in the presence of formic acid.

3,732,329

HYDROGENATION PROCESS UTILIZING HOMOGENEOUS COPPER CATALYSTS

Judith G. Thatcher and William R. Deever, Richmond, Va., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,166
Int. Cl. C07c *5/02, 11/02*
U.S. Cl. 260—683.9 **13 Claims**

This invention relates to process for hydrogenating unsaturated organic molecules such as olefins and diolefins to their saturated derivatives utilizing homogeneous catalysts comprised of cuprous halides complexed with ligands containing organic radicals bonded to elements, in the trivalent state, selected from Group V*a* (excluding nitrogen and bismuth), particularly those of the phosphine and phosphite type.

3,732,330

CURABLE COMPOSITIONS CONTAINING HYDROGEN-FUNCTIONAL ORGANOPOLYSILOXANES

Alan E. Mink and Darrell D. Mitchell, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Mar. 8, 1972, Ser. No. 232,962
Int. Cl. C08g *47/02*
U.S. Cl. 260—825 **11 Claims**

Trimethylsilyl-terminated methylhydrogensiloxy diphenylsiloxy copolymers containing from about 20 to 45 mol percent diphenylsiloxy units give increased strength and flexibility when used as the curing agent for vinyl-functional organopolysiloxanes.

3,732,331

PROCESS FOR THE PRODUCTION OF PLASTICS AND LACQUER RESINS FROM BASIC NITROGEN-CONTAINING GLYCIDYL COMPOUNDS AND DICARBOXYLIC ANHYDRIDES

Johannes Wollner, Moers-Kapellen, Martin Cherubim, Rheinkamp-Eick, and Friedrich Henn, Homberg-Niederrhein, Germany, assignors to Deutsche Texaco Aktiengesellschaft, New York, N.Y.

No Drawing. Filed Aug. 10, 1970, Ser. No. 62,692
Int. Cl. C08g *45/06*
U.S. Cl. 260—830 TW **12 Claims**

This invention concerns a process for increasing the hardening rates in the preparation of epoxide resins using dicarboxylic anhydrides as hardening agents. The increase in hardening rates is achieved by reacting mixtures of basic nitrogen-containing glycidyl compounds with dicarboxylic anhydrides. An optional aspect of the inventive process is to conduct the above reaction in the presence of alkyd resins and/or solvents.

3,732,332

PRODUCTION OF LOW MOLECULAR WEIGHT POLYANHYDRIDES AND EPOXY COMPOSITIONS DERIVED THEREFROM

Omer E. Curtis, Jr., Morristown, Harold W. Tuller, Long Valley, Charles T. O'Neill, Dover, and Ralph W. Nussbaum, West Orange, N.J., assignors to Allied Chemical Corporation

No Drawing. Filed Oct. 16, 1970, Ser. No. 81,616
Int. Cl. C08g *45/04*
U.S. Cl. 260—837 R **16 Claims**

Polyanhydrides are produced by a novel bulk polymerization procedure from maleic monomers and alkyl styrenes. The polyanhydrides, of low molecular weight and containing maleic monomer to alkyl styrene in a ratio greater than 1 to 1, are particularly useful as hardeners for epoxy resin-containing compositions and give

rise to epoxy compositions which result in cured products exhibiting high heat distortion temperatures and excellent electrical and self life properties.

3,732,333
FORMALDEHYDE BLOCK COPOLYMERS AND PROCESSES

Gerald J. Mantell, Kansas City, Mo., and Wayne E. Smith, Shawnee, Francis R. Galiano, Prairie Village, and David Rankin, Kansas City, Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

No Drawing. Filed Oct. 2, 1963, Ser. No. 313,192
Int. Cl. C08g *3/00*
U.S. Cl. 260—874 **6 Claims**

This invention relates to novel block copolymers of formaldehyde and to processes for preparing such copolymers. More specifically the invention concerns block copolymers of formaldehyde containing the grouping A—B which includes both A—B type block copolymers and B—A—B type block copolymers.

3,732,334
GRAFT COPOLYMERIC LUBRICATING OIL ADDITIVES

Ernst Koch, Traisa Uber Darmstadt, and Ulrich Schoedel, Rossdorf, Germany, assignors to Rohm GmbH, Darmstadt, Germany

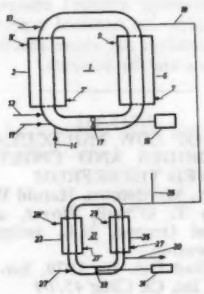
No Drawing. Continuation-in-part of abandoned application Ser. No. 792,762, Jan. 21, 1969. This appplication June 16, 1971, Ser. No. 153,899
Claims priority, application Germany, Jan. 23, 1968, P 17 45 359.7
Int. Cl. C08f *29/50, 33/08*
U.S. Cl. 260—875 **8 Claims**

Graft copolymers useful as lubricating oil additives and prepared by grafting an imidazole having an olefinically unsaturated group in the 1-position, e.g. a 1-vinyl-2-alkyl-imidazole, on a backbone polymer comprising acrylate, methacrylate, fumarate, and/or itaconate esters.

3,732,335
PROCESS FOR THE PREPARATION OF BLOCK POLYMERS

Jean Pierre Hermans, Strombeek-Bever, and Emile Leblon and Marcel Le Jeune, Brussels, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed May 26, 1971, Ser. No. 146,933
Claims priority, application Luxembourg, May 28, 1970, 61,007/70
Int. Cl. C08f *1/42, 15/04, 19/04*
U.S. Cl. 260—878 B **18 Claims**

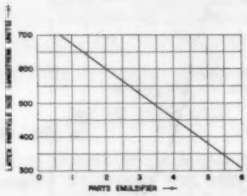


Polypropylene modified by a random copolymer of propylene and a second α-olefin is prepared by a two-stage process. In the first stage, propylene is polymerized in the presence of violet $TiCl_3$ and dialkylaluminum monochloride until polypropylene in an amount of about 80 to 99% by weight of the total quantity of polymer to be prepared has been formed. A second α-olefin and a second activator constituted by trialkylaluminum is then added to the system and in a second stage, the polymerization is continued, propylene being polymerized with the second α-olefin to form a random copolymer in an amount of 1 to 20% by weight of the total quantity of polymer to be prepared.

3,732,336
METHACRYLONITRILE POLYMERIZATION PROCESS

June T. Duke, Chagrin Falls, and Dorothy C. Prem, Warrensville Heights, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed June 2, 1971, Ser. No. 149,256
Int. Cl. C08f *15/22, 15/36, 19/16*
U.S. Cl. 260—881 **7 Claims**



A polymerization process is described in which methacrylonitrile homopolymers and copolymers are prepared by free radical polymerization at improved rates by conducting the polymerization in aqueous emulsion in the presence of some preformed seed polymer having small particle size.

3,732,337
THERMOPLASTIC CROSSLINKED POLYESTER MATERIAL AND METHOD OF MOLDING

William J. Heilman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 849,180, Aug. 11, 1969. This application Aug. 27, 1971, Ser. No. 175,759
The portion of the term of the patent subsequent to Feb. 15, 1989, has been disclaimed
Int. Cl. C08f *37/18*
U.S. Cl. 260—897 B **12 Claims**

A polyanhydride, such as a copolymer of maleic anhydride and an alpha-olefin, when heated together with a polymeric polyol, such as polyvivnyl alcohol, yields a polyester crosslinked material. When heated to a temperature in excess of 80° C., this crosslinked polyester material flows and can be molded. On slow cooling, this material may again become crosslinked and insoluble in solvents such as acetone.

3,732,338
MIXTURES OF ETHYLENE-PROPYLENE RUBBERS AND POLYPENTENAMERS

Dieter Theisen, Remscheid, Friedrich Haas, Cologne, and Manfred Beck, Odenthal-Globusch, Germany, assignors to Bayer Aktiengesellschaft

No Drawing. Filed Dec. 20, 1971, Ser. No. 210,163
Claims priority, application Germany, Dec. 24, 1970, P 20 63 716.5
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 **11 Claims**

Rubber mixtures of
(a) 5–95% by weight of ethylene-propylene rubber and
(b) 95–5% by weight of polypentenamer.

3,732,339

FILAMENTS AND FILMS OF ACRYLONITRILE POLYMERS WHICH ARE FREE FROM VACUOLES

Carlhans Suling and Heino Logemann, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 25, 1971, Ser. No. 128,180
Claims priority, application Germany, Mar. 26, 1970, P 20 14 764.2
Int. Cl. C08f 29/56
U.S. Cl. 260—898 13 Claims

Vacuole free filaments and films of acrylonitrile homopolymers and copolymers containing at least 80% acrylonitrile, which contain 0.1 to 4% of a copolymer of acrylonitrile and dimethylacrylamide.

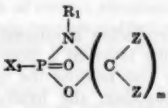
3,732,340

N',O-PROPYLENE PHOSPHORIC ACID ESTER DIAMIDES

Herbert Arnold, Heidelberg, Norbert Brock, Uerentrup, and Friedrich Bourseaux and Heinz Bekel, Brackwede, Westphalia, Germany, assignors to Asta-Werke Aktiengesellschaft Chemische Fabrik, Brackwede, Westphalia, Germany

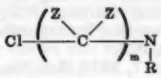
No Drawing. Continuation-in-part of applications Ser. No. 650,232, June 30, 1967, and Ser. No. 71,339, Sept. 11, 1970. This application Jan. 14, 1971, Ser. No. 106,569
Int. Cl. C07d 105/04; A01k 27/00
U.S. Cl. 260—936 7 Claims

There are provided new N-substituted amides and esteramides of phosphoric acid of the Formula I:



(I)

wherein R_1 is a lower alkyl group having from 1 to 4 carbon atoms being substituted with one or several halogen atoms, Z is hydrogen or a lower alkyl group having from 1 to 4 carbon atoms, *m* is 2 or 3 and X_2 is the ethylene imino group or the group having the formula:



wherein R is hydrogen or a lower alkyl group having from 1 to 4 carbon atoms which may be substituted with a chlorine atom or a hydroxy group, and Z and *m* have the above-given meaning.

Each of these products is useful as a cytostatically effective compound and is used in the manner exemplified hereinafter with respect to test animals, e.g. rats, according to known techniques for administering test dosages.

3,732,341

(ALKYL AND O-ALKYLOXY ALKYL)-O-ALKYL-S-(1,2,2 - TRICHLORO-ETHYL)-THIONOTHIOL PHOSPHORIC AND PHOSPHONIC ACID ESTERS

Wilhelm Sirrenberg, Sprockhovel, Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 30, 1970, Ser. No. 7,263
Claims priority, application Germany, Feb. 4, 1969, P 19 05 356.6
Int. Cl. C07f 9/08; A01n 9/36
U.S. Cl. 260—950 6 Claims

(Alkyl and O-alkyl)-O-alkyl-S-(1,2,2-trichloroethyl)-thionothiol phosphoric and phosponic acid esters, i.e. (alkyl, O-alkyl and O-alkoxy-alkyl)-O-(alkyl and alkoxy-alkyl)-S-(1,2,2 - trichloro-ethyl) - thionothiol phosphoric and phosphonic acid esters, which possess arthorpodicidal, especially insecticidal and acaricidal, properties, and which may be produced by conventional methods.

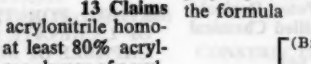
3,732,342

BROMINATED PHOSPHATES

Carl L. Gibbons and Charles E. Reineke, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 2, 1970, Ser. No. 86,339
Int. Cl. C07f 9/08
U.S. Cl. 260—950 3 Claims

Compounds useful as fire retardant plasticizers for polyvinyl chloride and as fire retardants for latex having the formula



wherein R and R' are independently for each of the *n* units H or methyl provided that both R and R' are not methyl in any one unit, and
n is an integer of 1–10 have been discovered.

3,732,343

1-HALO-2-ARYLOXY-VINYL (2)-PHOSPHATES

Henry Martin and Jozef Drabek, Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Aug. 17, 1970, Ser. No. 64,648
Claims priority, application Switzerland, Aug. 18, 1969, 12,553/69; Sept. 25, 1969, 14,452/69
Int. Cl. C07f 9/08; A01n 9/36
U.S. Cl. 260—951 18 Claims

1-halo-2-aryloxy-vinyl(2)-phosphates are very effective compounds for combating pests, such as insects, nematodes and representatives of the order Acarina as well as plant-pathogenic bacteria and fungi. The new phosphates may be used in the form of pesticidal preparations.

3,732,344

PREPARATION OF PHOSPHOROAMIDOTHIONATE BY ANHYDRIDE ACYLATION

James L. Platt, Jr., San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed July 21, 1971, Ser. No. 164,895
Int. Cl. C07f 9/02, 9/24
U.S. Cl. 260—984 7 Claims

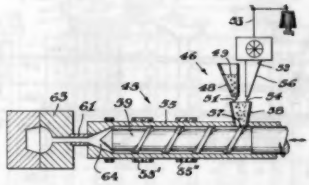
N-acyl derivatives of O,O-dialkyl phosphoroamidothionate are prepared by reacting O,O-dialkyl phosphoroamidothionate with an anhydride in the presence of a catalytic amount of a strong acid at a temperature of from 20–90° C.

3,732,345

METHOD FOR THE INCORPORATION OF FILAMENTARY MATERIAL IN A RESINOUS MATRIX

James L. Amos, Midland, and Arnett L. Bird and Robert P. Snyder, Saginaw, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of application Ser. No. 532,819, Jan. 7, 1966, which is a continuation-in-part of application Ser. No. 342,659, Feb. 5, 1964, which in turn is a continuation-in-part of application Ser. No. 302,504, Aug. 16, 1963. This application Apr. 16, 1970, Ser. No. 29,095
Int. Cl. B29f 1/02, 3/02; C08f 45/10
U.S. Cl. 264—329 28 Claims



Glass reinforced thermoplastics are formed by directly adding chopped filaments and particulate thermoplastic

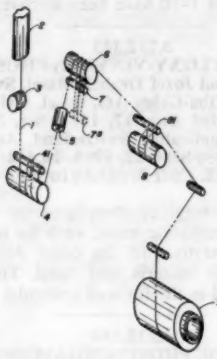
resin to heat fabricating apparatus such as an extruder or pre-plasticizing injection molding machine under non-stratifying conditions to provide a glass reinforced molded article.

3,732,346

METHOD TO PRODUCE SPUN-DRAWN POLYCAPROLACTAM YARN HAVING IMPROVED RESISTANCE TO OZONE FADING

William Cyrus Mallonee, Chester, and Peter Reginald Saunders, Richmond, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,304
Int. Cl. D01d 5/12; B29c 17/02
U.S. Cl. 264—210 F 1 Claim



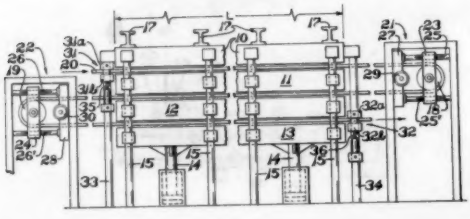
A continuous process and its product for spinning and drawing polycaproamide filaments is disclosed. The method is the coupled or continuous process of extruding filaments, cooling and applying finish, then immediately drawing the filaments. The improved resistance to ozone fading is accomplished by feeding the filaments after the finish applying step with a heated feed roll through an air cooling jet to a cooled draw roll and withdrawing filaments to a second draw roll, then winding the filaments into a package.

3,732,347

METHOD FOR VULCANIZING OPEN END BELTING

David G. Hunt, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Original application Jan. 22, 1969, Ser. No. 793,033, now Patent No. 3,647,342. Divided and this application June 3, 1971, Ser. No. 149,835
Int. Cl. B29h 7/22
U.S. Cl. 264—231 2 Claims



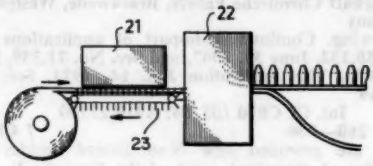
A method for curing long lengths of reinforced elastomeric, open end, conveyor belting in a multiple-decked vulcanizing press. The portions of the belt being cured are subjected to substantially uniform stretch prior to closing the press by outrigger rollers over which the belt is trained as it passes continuously from one platen to another. When the portions between the press platens are cured, the belting is advanced longitudinally over the rollers to permit vulcanizing the portions previously extending over the rollers.

3,732,348

METHOD FOR THE PRODUCTION OF A STRIP OF LAMINATE MATERIAL FROM A MATERIAL CAPABLE OF BEING HEAT FORMED

Rolf Lennart Ignell, Lund, Sweden, assignor to Sobrefina SA, Fribourg, Switzerland

Filed May 12, 1969, Ser. No. 823,593
Claims priority, application Sweden, May 21, 1968, 6,841/68
Int. Cl. B29d 7/22; B44d 1/092, 1/16
U.S. Cl. 264—134 9 Claims



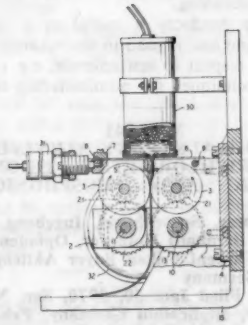
A method for producing laminated strip material by applying at least one layer of a polymer to a different base polymer layer and heating the composite layers to sinter the layers together, the heated composite layer being capable of being formed into objects.

3,732,349

PROCESS FOR SIMULTANEOUSLY SHEARING AND QUENCHING POLYMER FILMS

Ho-Sou Chen, Summit, Ti Kang Kwei, Millington, and Tsuey Tang Wang, Stirling, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.

Filed Jan. 7, 1971, Ser. No. 104,708
Int. Cl. B29c 15/00; B29d 7/14
U.S. Cl. 264—175 4 Claims



A process is described for producing polymer films with improved mechanical properties using substantially crystalline polymers. This is achieved by exposing molten polymer simultaneously to high shearing and quenching rates by contacting the molten polymer with a dry metallic surface which presses against the molten polymer. This process also increases the transparency of the polymer film.

ELECTRICAL

3,732,350
POWER CONTROL

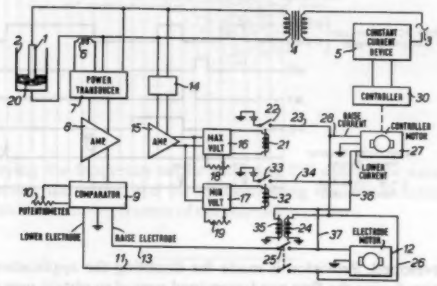
Geoffrey Hoyle, and David Melvin Longbottom, both of Sheffield, England, assignors to The British Iron and Steel Association, London, England

Filed Nov. 18, 1971, Ser. No. 199,914

Claims priority, application Great Britain, Dec. 3, 1970, 57452/70

Int. Cl. H05b *3/60*

U.S. Cl. 13—9 **9 Claims**



Electroslag refining plant comprising an electrode, a mould for containing a bath of molten electrically-conductive slag into which the electrode depends and below which an ingot of refined material is formed, means for maintaining the supply of electric current to the electrode at a pre-determined value, means for detecting changes in the power supplied by the electrode to the slag bath, means for causing movement of the electrode relative to the formed ingot to maintain the power supplied at a required value, means for detecting movement of the electrode outside of pre-determined limits of maximum and minimum distances from the formed ingot and, upon such movement being detected, for returning the electrode to a position within said maximum and minimum distances and for re-setting the value of the current supply so that the required value of power supply can be met by movement of the electrode within the pre-determined limits.

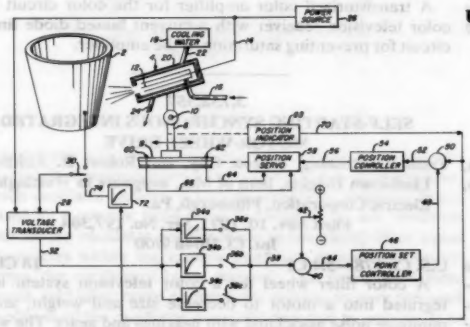
3,732,351
CONTROL SYSTEM FOR ARC VOLTAGE OF A PLASMA ARC TORCH

Ronald G. Schultz, Bay Village, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 18, 1972, Ser. No. 254,588

Int. Cl. H05b *7/00*

U.S. Cl. 13—13 **5 Claims**



A control system for the arc voltage drop in a furnace heated by a plasma arc torch has a voltage transducer providing a signal representative of the arc voltage drop. A function generator, based on the ionizing gas used, alters the signal to provide a constant loop gain. The altered signal is compared to a desired voltage drop and the resulting error signal is used to move the torch towards of away from the furnace.

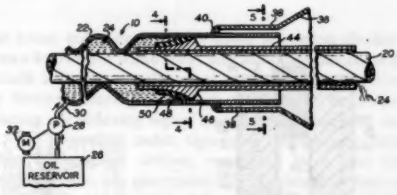
3,732,352
CONSTRUCTION FOR END OF CABLE SHEATH AND METHOD OF WELDING SHEATH

Attila Dima, Piscataway, and George S. Eager, Jr., Upper Montclair, both of N.J., assignors to General Cable Corproation, New York, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,383

Int. Cl. H02g *15/20, 1/14*

U.S. Cl. 174—10 **10 Claims**



This application for welding an oil impermeable sheath of a high voltage power cable uses a tube inserted into the clearance between the core and the sheath of the cable to shut off oil circulation through this clearance immediately inside the sheath. The tube extends beyond the end of the sheath and oil flows from the end of the cable during the welding operation even though the space within the sheath immediately under the region of welding is free of oil. The sheath can be welded to a joint housing without oil contamination of the weld and the invention prevents vaporization of oil and possible blow-out of near molten areas of the sheath adjacent to the weld.

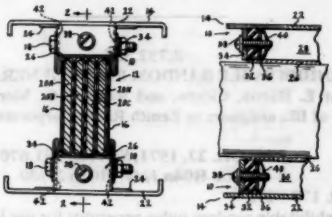
3,732,353
MOISTURE SEAL AND FIRE BARRIER FOR ELECTRICAL BUS DUCT

Martin F. Koenig, Milwaukee, Wis., and Manuel Issa, deceased, late of Milwaukee, Wis. (by Patrick T. Sheedy, administrator), assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed March 22, 1972, Ser. No. 237,025

Int. Cl. H02g *5/06*

U.S. Cl. 174—68 B **12 Claims**



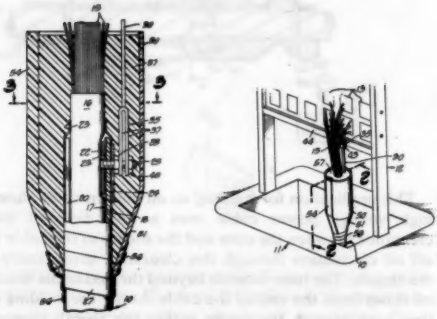
A sealing device, including a resilient sealing member interposed between a pair of retaining plates and a through bolt

threadably mounted to a bowed metallic clamping member, is installed inside the ends of the hat sections of a bus duct above and below the edges of the bus bars. As the through bolt is tightened, the sealing member is squeezed into sealing engagement with the inside walls of the hat section to provide a moisture-proof seal and the edges of the clamping member bite into the inside walls of the hat section to secure the device in place and provide a metal-to-metal fire barrier.

3,732,354
CABLE END SEAL, SUPPORT AND GROUNDING ASSEMBLY

John T. Thompson, 244 Loring St., Los Angeles, Calif., and George W. Gillemot, 2331 20th St., Santa Monica, Calif.

Filed Jan. 19, 1971, Ser. No. 107,794
Int. Cl. H02g *15/02*
U.S. Cl. 174—78 **14 Claims**



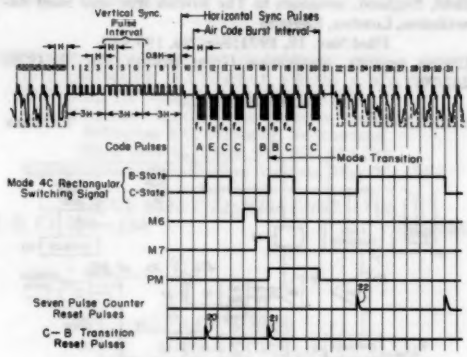
Means for hermetically sealing, suspending and grounding a shielded multi-conductor cable relative to a pedestal-type terminal board facility. The components utilized for these purposes include a first solderless terminal assembly embracing and clamping the cable shield and sheath together, a pair of compressable solderless terminals telescoped over the opposite ends of a combination cable suspension and grounding conductor strap anchorable at one end to the clamping bolt of the first solderless terminal assembly and the other end to the terminal board facility. A slit sleeve loosely embraces the cable end and is charged with potting compound thereby hermetically sealing together the cable end, the sleeve and the adjacent components of the suspension unit and precluding the entry of moisture into the cable.

3,732,355
INHIBITABLE RANDOM PULSE GENERATOR

Hyacint E. Harna, Cicero, and Richard G. Merrell, Darien, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 22, 1971, Ser. No. 191,670
Int. Cl. H04n *1/44*; **H03b** *29/00*
U.S. Cl. 178—5.1 **12 Claims**

An inhibitable random pulse generator for use in a subscription television system or the like generates an output pulse indicative of a random one of a series of possible counting states, one or more of which may be inhibited to narrow selection to the remaining states. A counter included in the generator first has random noise applied to it for a predetermined period of time, leaving the counter in an unpredictable random counting state. Stepping pulses are then applied to step the counter to the first uninhibited state, at which time counting action ceases and a representative output pulse is

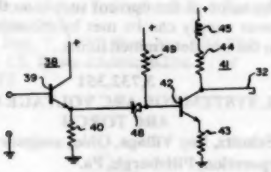


developed. Provision is made for disabling the application of noise during the first predetermined period to obtain non-random operation of the counter for test purposes.

3,732,356
COLOR AMPLIFIER

Lester Tucker Matzek, Lombard, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed June 2, 1971, Ser. No. 149,300
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 R **8 Claims**



A transistorized color amplifier for the color circuit of a color television receiver with a current biased diode limiter circuit for preventing saturation of the amplifier.

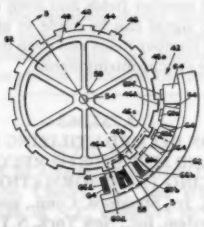
3,732,357
SELF-STARTING SYNCHRONOUS INTEGRATED MOTOR-WHEEL DRIVE

Frank C. Rushing, Ellicott City, and Robert R. Aulthouse, Linthicum Heights, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1971, Ser. No. 197,304
Int. Cl. H04n *9/00*
U.S. Cl. 178—5.4 CF **18 Claims**

A color filter wheel for a color television system is integrated into a motor to decrease size and weight, and to minimize noise associated with bearings and gears. The wheel is rotatably mounted on a frame and has rotor poles mounted concentrically about its axis of rotation and stator poles mounted on the frame in operative spaced relationship to the rotor poles. Different pairs of stator poles are sequentially

aligned with different pairs of rotor poles as the wheel rotates and are sequentially energized by a pulsating DC source for causing rotation of the filter wheel. Means are provided for



varying the frequency of the pulsating DC source for ease of starting the wheel and for synchronizing the wheel rotation with the scanning frames of the television camera.

3,732,358

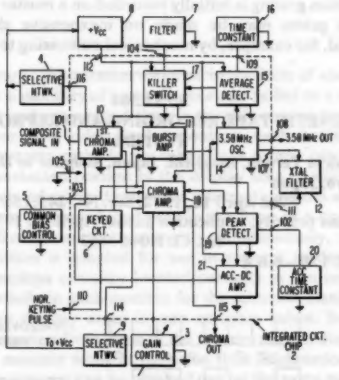
AUTOMATIC CHROMA CONTROL CIRCUITS

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 822,951, May 8, 1969, Pat. No. 3,604,842. This application April 14, 1971, Ser. No. 134,036

Int. Cl. H04n 9/48

U.S. Cl. 178—5.4 AC **4 Claims**



Automatic chroma control circuitry employs a peak detector circuit, operated from a chroma oscillator configuration, which oscillator exhibits a varying amplitude response determined by a narrow band filter included in an a.c. feedback path for the oscillator and arranged to selectively filter signal frequencies within the narrow bandpass as coupled thereto during the oscillatory burst interval. The bandpass filtered signals, including noise components serving to vary the peak amplitude of the oscillator cause the detector to provide at an output a control voltage proportional to the highest peak of the oscillator. This control voltage is applied to a chroma amplifier stage for varying the gain in accordance with varying oscillator amplitude.

3,732,359

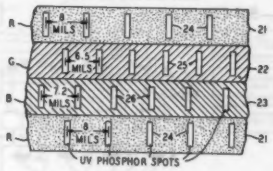
BEAM INDEX COLOR TELEVISION DISPLAY DEVICE

Yen-Sun Chen, Fanwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 19, 1972, Ser. No. 245,452

Int. Cl. H04n 9/24

U.S. Cl. 178—5.4 H **2 Claims**



The beam index concept for color television display tubes has been known for some time, and although this color display approach is fundamentally more attractive than the commercially favored three-gun shadow mask tube, techniques for producing the indexing signal have been inadequate. According to the invention, index signals in a single-gun tube with horizontal phosphor stripes, operating in a line (color)-sequential mode, are generated by UV phosphor bars spaced uniformly along each color stripe but with different spacings for each color. As the beam scans a stripe, an optical signal is generated with a frequency corresponding to the periodicity of the phosphor index bars. The optical signal is detected with a UV detector. The amplitude of each frequency will indicate the beam size and vertical position. The index signals are fed to a signal processor which, by simple filtering, will generate error correction signals which are in turn fed to the deflection circuit to correct the beam position. The use of the optical index signal ensures isolation of the beam index signal from the video.

3,732,360

COLOR TELEVISION SYSTEM HAVING APERTURE CORRECTION

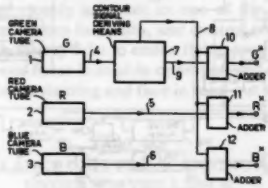
Hendrik Breimer, and Sing Liong Tan, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 624,944, March 21, 1967, abandoned. This application Feb. 15, 1972, Ser. No. 226,432

Claims priority, application Netherlands, March 26, 1966, 6604020

Int. Cl. H04n 5/14

U.S. Cl. 178—5.4 R **6 Claims**



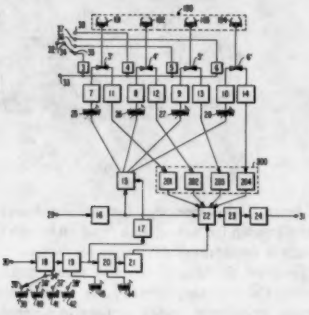
In a color television camera system of the type having camera tubes for the production of red, green and blue color signals, contour signals derived from only one of the color signals are added to all of the color signals.

3,732,361

COLOR VIDEO SIGNAL MAGNETIC RECORDING-REPRODUCING SYSTEM HAVING A FUNCTION OF OPTIMUM RECORDING CURRENT LEVEL SETTING

Satoshi Makara, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed March 22, 1971, Ser. No. 126,862
Claims priority, application Japan, March 25, 1970, 45/25447
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 CD 6 Claims



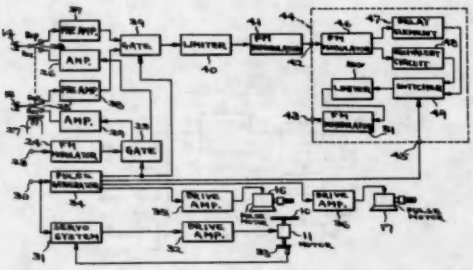
Disclosed is a system and method, applicable to color video magnetic recording and reproducing systems, for determining the optimum recording current for each head of a multi-head assembly to produce optimum picture quality. According to the teachings of the invention the scanning tracks of adjacent heads are made to at least partially overlap by causing the magnetic tape to move at a speed slower than normal. A first head records an FM signal modulated by a color test signal while the adjacent head producing an overlapping scanning track reproduces it. The level of the chroma signal of the reproduced and demodulated color test signal is compared with the test signal to control the level of the recording current.

3,732,362

SIGNAL PROCESSING SYSTEM FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

Hisao Kinjo, Minami-ku, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Kanagawa-ku, Yokohama City, Japan

Filed Aug. 11, 1969, Ser. No. 848,900
Claims priority, application Japan, Aug. 14, 1968, 43/57478
Int. Cl. H04n 5/78; G11b 21/02
U.S. Cl. 178—6.6 DD 7 Claims



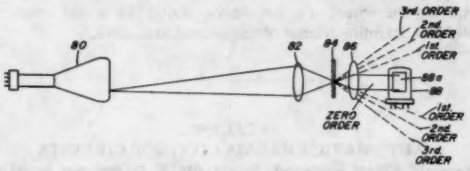
This is a signal processing system for magnetic recording and reproducing apparatus using a circular, rotary magnetic body on which video signals, for example, are recorded and reproduced a plurality of magnetic heads intermittently and alternately move radially over said rotary magnetic body, each field of the video signals being recorded in one concentric circular track. Slow motion playback or still playback of the signal recorded in circular said track is effected by reproducing the signal a plurality of times. This signal processing system synchronizes and shape field setting pulses by frame pulses of an external reference synchronizing signal. The relation between odd number fields and even number fields of a reproduced video signal can be made to agree with the relation between odd number fields and even number fields of the external reference synchronizing signal.

3,732,363

INFORMATION RECORD UTILIZING DIFFRACTION GRATING AND METHODS OF RECORDING AND REPRODUCING THE INFORMATION THEREOF

William E. Glenn, Jr., Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Aug. 16, 1971, Ser. No. 171,809
Int. Cl. G01d 15/10; G11b 7/26
U.S. Cl. 178—6.6 TP 19 Claims



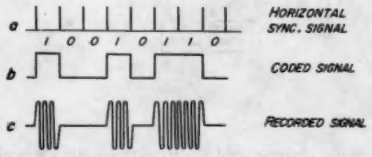
In a system for recording and reproducing picture information, a record medium utilizing diffraction gratings modulated in accordance with the picture information which, upon reproduction effected by directing light therethrough, the zero-order diffracted light is modulated in accordance with the picture information. The picture information-representing diffraction grating is initially recorded on a master from which release prints may be made on inexpensive sheet plastic material, for example, by mechanical embossing techniques.

3,732,364

MAGNETIC TAPE RECORDING AND REPRODUCING SYSTEM

Toshimichi Terada, Inagi-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed April 18, 1972, Ser. No. 245,155
Claims priority, application Japan, April 21, 1971, 46/25238
Int. Cl. H04n 5/62
U.S. Cl. 178—6.6 A 6 Claims



A magnetic tape recording and reproducing system wherein a television signal and digital information are recorded in multiplex recording on the same area of a magnetic tape. In recording, according to an external instruction specifying a picture frame and digital information to be recorded, the horizontal sync. signal for the specified picture frame is extracted, and the extracted horizontal sync. signal is used to produce shift pulses determining the region for recording digital information. The digital information which is separate-

ly recorded is read out in accordance with the shift pulses thus produced, and the digital signal thus read out is used to modulate a sinusoidal signal at a frequency outside of the frequency band of the television signal for recording of the modulated signal in superimposition upon the television signal on the same area of the magnetic tape.

In reproduction, the recorded digital information signal is separated through a tuned amplifier, and the digital information and the television signal are recovered through a sequence of process similar to that at the time of the recording.

3,732,365

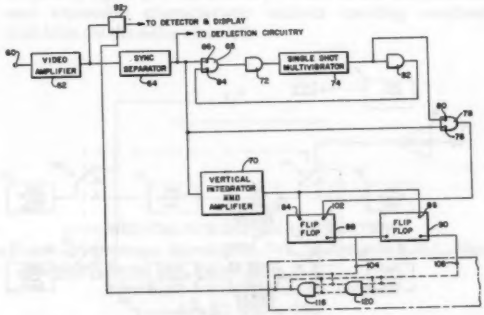
SELECTIVE BLANKING OF VIDEO DISPLAY

Frederick D. Rando, Cherry Hill, and William P. Rogers, Collingswood, both of N.J., assignors to Ultronic Systems Corporation, Moorestown, N.J.

Division of Ser. No. 756,916, Sept. 3, 1968, Pat. No. 3,624,516. This application July 1, 1971, Ser. No. 158,677

Int. Cl. H04n *5/24*

U.S. Cl. 178—6.8 **4 Claims**



Alphanumeric information supplied in the form of electrical signals from a plurality of input sources can be fed to a central control unit and rearranged therein for subsequent transmission to one or more video display monitors, each monitor employing a separate cathode ray tube. Each source can be assigned a preselected portion of the display area on each tube whereby each tube can display the information from each of the sources in its preassigned area in the form of a complete display of all of the sources apparently simultaneously.

Our invention is adapted for use in systems as described above. It employs circuitry located partially in the common unit and partially in each monitor for the selective blanking of one or more display areas in one or more tubes. In other words, information from some of the sources may be displayed by any one monitor while at the same time information from others of the sources can be blanked out on the same monitor. To this end, control pulses identified with corresponding input sources are sequentially introduced at the unit for transmission to all of the monitors. Circuitry at each monitor can be selectively enabled to detect such control pulses and to utilize the detected pulses for selective blanking.

3,732,366

VIDEO PATTERN RECOGNITION SYSTEM

Victor W. Bolie, c/o Oklahoma State University School of Electrical Engineering, Stillwater, Okla.

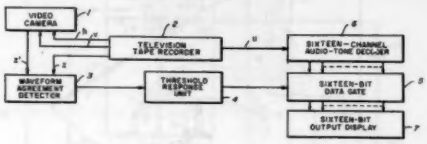
Filed Aug. 13, 1971, Ser. No. 171,547

Int. Cl. G06k *9/08, 9/12;* **H04n** *7/18*

U.S. Cl. 178—6.8 **14 Claims**

This invention comprises a video camera and a video tape carrying previously recorded video patterns, and means for comparing the camera-generated signal pattern with the played-back tape recorded signal pattern to see whether they are similar. The sweep signals of the camera are slaved to the playback device so that the sweeps are synchronous. The brightness signals are continuously compared and an average judgment made of the similarities of the two patterns.

Means are provided to normalize the pattern generated by the camera as regards size, angular position and position in the field of view.



Two principal applications of this system are described. These are:

a. Searching a pre-recorded file of patterns on video tape for frames which are similar to a pattern exposed to the camera, and

b. Comparing a current pattern of a field of view with a pattern recorded at a previous time of the same field of view, to indicate changes in the camera-produced pattern.

3,732,367

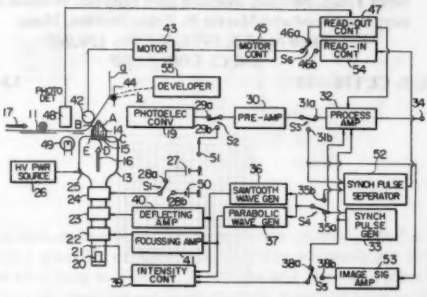
APPARATUS FOR FACSIMILE USING A PRISM-SHAPED FIBER OPTICS

Akio Teranishi, and Eiichi Miyazaki, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma City, Osaka, Japan

Continuation-in-part of Ser. No. 97,064, Dec. 15, 1970, abandoned. This application April 7, 1972, Ser. No. 242,009

Int. Cl. H04n *5/68, 5/84*

U.S. Cl. 178—6.8 **1 Claim**



A read-in and read-out apparatus for a facsimile system which comprises a cathode ray tube having a prism-shaped fiber optics faceplate, feeding means for advancing an information medium closely adjacent to one of the slanting end faces of the fiber optics faceplate, and control means for controlling the cathode ray tube to emit a flying-spot from the one of the slanting end faces in read-in operation and emit a flying-spot from the other slanting end face in read-out operation.

3,732,368

SURVEILLANCE UNIT FOR SCANNING AN AREA UNDER SURVEILLANCE

Salim S. Mahlab, Hackensack, N.J., assignor to Telesphere Technology, Inc., Hackensack, N.J.

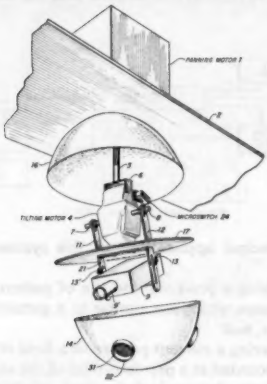
Filed April 23, 1971, Ser. No. 136,737

Int. Cl. H04n *5/00*

U.S. Cl. 178—7.81 **20 Claims**

A generally spherical surveillance unit is disclosed which is supported from the ceiling by a vertically oriented surveil-

lance unit support shaft which rotates the entire surveillance unit in the panning mode either manually or automatically and which supports the weight of the surveillance unit. A TV camera or other surveillance subunit is coupled to a tilting motor which is mounted inside a spherical enclosure and



which in turn is supported by the support shaft. The tilting motor tilts the camera along with the spherical enclosure surrounding the surveillance unit to provide for tilting of the unit along with panning of the unit for maximum coverage. The entire unit is "mod" in appearance and is unobtrusive in the performance of its scanning functions.

3,732,369

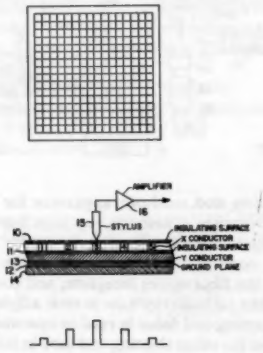
COORDINATE DIGITIZER SYSTEM

William L. Cotter, Beverly, Mass., assignor to Welland Investment Trust, Newton, Mass., a part interest; William F. Kenney, Westwood and Martin H. Reiss, Newton, Mass.

Filed April 5, 1971, Ser. No. 130,969

Int. Cl. G08c *21/00*

U.S. Cl. 178—18 **13 Claims**



A coordinate digitizer employs a stylus whose position on a platen is converted into digitized coordinates by utilizing the signals capacitively coupled to the stylus. The platen has a coarse grid formed by two crossed sets of parallel wires regularly spaced along the coordinate axes. The platen also has a fine grid of crossed sets of parallel wires spaced more closely along the coordinate axes than the coarse grid wires. The wires in a fine grid set are constituted by four groups of wires. To digitize the stylus position along one coordinate axis, all the wires of a group are electrically pulsed together, each group being pulsed in turn. The wires of the coarse grid are then pulsed, one at a time, in sequence. The signals detected by the stylus from the pulsing of the fine wires are used to establish a "fine" digitized position that periodically recurs along the coordinate axis. The signals detected by the stylus from the pulsing of the coarse wires are used to establish a "coarse" digitized position that uniquely fixes the fine position on the coordinate axis. The system then scans the wire of the other coordinate axis in the same manner to digitize the position of the stylus on that axis. The system alternately scans the coordinate axes to repetitively digitize the position of the stylus with sufficient rapidity to track the movements of the stylus.

3,732,370

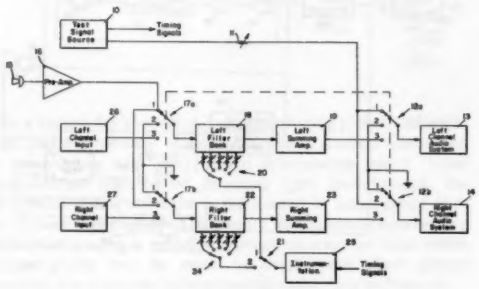
EQUALIZER UTILIZING A COMB OF SPECTRAL FREQUENCIES AS THE TEST SIGNAL

Jack Sacks, Palos Verdes Estates, Calif., assignor to United Recording Electronic Industries, Hollywood, Calif.

Filed Feb. 24, 1971, Ser. No. 118,454

Int. Cl. H03j *5/24*

U.S. Cl. 179—1 D **14 Claims**



A system and method is described for electronically equalizing the composite transfer function of a loud speaker system and room which receives the sound generated by the speaker system. A test signal source is broadcast into a room through the normal loud speaker amplifier system. A substantially flat microphone and preamplifier is used to detect the system and feed the detected audio signal through a bank of audio filters substantially covering the low, middle, and high range audio spectrum from approximately 30 cycles to 20 kilohertz (KHZ) by using approximately three narrow band peaking filters per octave. The power in the bandwidth of each filter is detected and measured against a known reference and the individual gain of each of the filters is adjusted to obtain a substantially flat acoustic response. The normal conventional input sound source, be it a tuner or tape deck, is then fed through the adjusted bank of narrow band filters directly into the audio sound system for broadcast into the room in the conventional manner.

3,732,371

WIDE DYNAMIC RANGE NOISE MASKING COMPANDOR

Richard S. Burwen, 12 Holmes Road, Lexington, Mass.

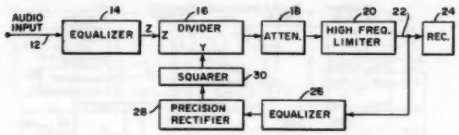
Filed May 10, 1971, Ser. No. 141,544

Int. Cl. H04b *1/64*

U.S. Cl. 179—1 R **24 Claims**

A noise masking compandor for greatly reducing the noise added to a wide dynamic range audio signal in passing through a noisy channel, such as a tape recorder. The audio signal, having a dynamic range of approximately 90 db, is com-

pressed to a dynamic range of approximately 30 db for transmission through the noisy channel then subsequently expanded in a complementary fashion to its original 90 db range to provide a faithful reproduction of the original signal without noticeable noise. Compression and expansion result from high precision rectifiers to minimize distortion, and are



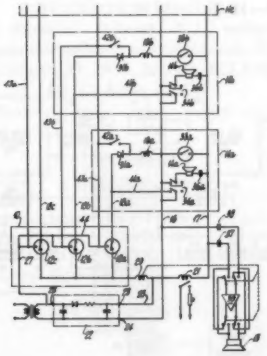
further achieved without the need for maintaining precisely constant input and output levels for the noisy channel to avoid frequency response distortion. A high degree of high and low frequency signal preemphasis is provided in the compression and expansion characteristic without creating overload problems for the noisy channel.

3,732,372

MULTI-UNIT INTERCOM SYSTEM

Frank Tramontano, Forest Hills, N.Y., assignor to E.R.L. Electronic Products, Inc., Forest Hills, N.Y.

Filed Sept. 14, 1971, Ser. No. 180,413
Int. Cl. H04m 9/02
U.S. Cl. 179—2 A **10 Claims**



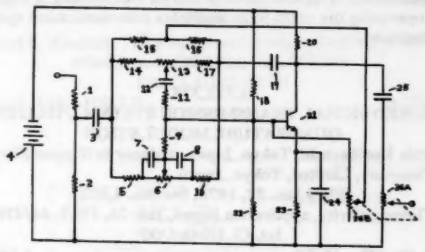
A multi-unit intercom system is disclosed in which a plurality of remote stations can be signaled from a common station. Switches are provided at the remote stations for persons located there to either control a two-way communications link between the particular remote station and the common station or operate an electrical device such as a door latch for admitting the person at the central station to a facility.

3,732,373

TONE CONTROL CIRCUITS

Willis Guild Boyden, 24 Press Avenue, Norwood, Mass.

Filed Oct. 12, 1971, Ser. No. 188,229
Int. Cl. H03g 5/00
U.S. Cl. 179—1 D **1 Claim**



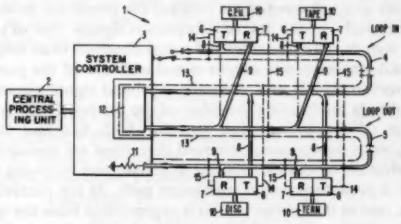
A combined tone and volume control circuit in which two ganged potentiometers are used to simultaneously vary the volume of and effect of the tone control on a signal.

3,732,374

COMMUNICATION SYSTEM AND METHOD

Edouard Y. Rocher, Ossining, and Stanley E. Schuster, Granite Springs, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,243
Int. Cl. H04j 3/08
U.S. Cl. 179—15 AL **30 Claims**



A multi-loop multiplex communication system is disclosed wherein a plurality of remote transmitting terminals are connected via a loop to a system controller and wherein a plurality of remote receivers are connected via a second loop to the same system controller. In operation, all communications between devices associated with the first loop, the second loop and the system controller are carried out via assigned time slots in a system time frame. Under control of the system controller, all communications between devices associated with the first loop and devices associated with the second loop are carried out via non-assigned time slots in the system time frame. When device-to-device communications are being carried out, means are provided at the system controller for connecting the first and second loop in series converting the two loops from their essentially parallel operation when devices associated with either loop interact with the system controller. In one embodiment, a variable time delay is provided at the system controller called a compensation delay which, regardless of the loop lengths, in conjunction with the propagation delay, makes the total delay a constant value. This permits the use of the same assigned time slot by the transmitter and receiver associated with a given device and which are connected to different loops. In another embodiment, the delay arrangement is eliminated by providing a third cable which is

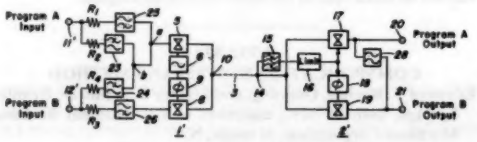
in parallel with both loops and which provides a bit, byte and frame synchronization for all devices associated with both loops. In the latter arrangement, however, device-to-device communication is still carried out using nonassigned time slots while device-to-system controller and system controller-to-device communications are still carried out on assigned time slots. A controller switching arrangement is shown along with an example of a typical terminal device and, further, a method for operating the multi-loop multiplex communication system is disclosed.

3,732,375

PAIRED SIGNAL TRANSMISSION SYSTEM UTILIZING QUADRATURE MODULATION

Michio Kuribayashi, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Jan. 22, 1970, Ser. No. 4,872
Claims priority, application Japan, Jan. 24, 1969, 44/4706
Int. Cl. H04h *5/00*
U.S. Cl. 179—15 BT **1 Claim**



Signal transmission systems for the transmission of a pair of information signals are provided in accordance with the teachings of the present invention wherein a pair of carrier signals in quadrature phase relation are amplitude modulated, respectively, by the pair of information signals. One of the carrier signals, a double sideband signal obtained from amplitude modulating such one carrier signal with one of the pair of information signals and a double sideband signal obtained by amplitude modulating the other of the carrier signals with the other of the information signals which has had the low frequency components removed therefrom are transmitted as quadrature modulation signals to at least one receiving station over a predetermined transmission path. At the receiving station, one of the carrier signals is regenerated from the quadrature modulation signals received thereby and such regenerated carrier signal is relied upon to accomplish the demodulation of the quadrature modulation signals received.

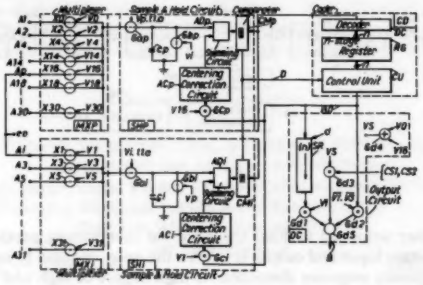
3,732,376

TIME DIVISION MULTIPLEX CODER

Andre Edourd Joseph Chatelon, Montrouge, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed March 10, 1972, Ser. No. 233,648
Int. Cl. H04j *3/12*
U.S. Cl. 179—15 BY **10 Claims**

The coder disclosed has two sample and hold circuits, one of which is primarily for sampling the analog signals for even numbered input sources and the other of which is for sampling the analog signals of odd numbered input sources. In addition, there is provided a coder centering circuit associated with each of the sample and hold circuits and a single feedback type coder coupled to each of the sample and hold circuits and each of the coder centering correction circuits. Two even numbered channels VO and V16 are employed for the transmission of signalling and synchronization data while an odd numbered channel V1 and and even numbered channel V16 is employed to actuate the two centering circuits. The even numbered channel sample and hold circuit has one odd numbered input signal coupled thereto during channel time V0, the analog coder centering reference signal coupled thereto during channel time V16 and the even numbered analog input signals coupled thereto during the remainder of the even numbered channel time. The odd numbered channel sample and hold circuit has the analog coder centering reference signal coupled thereto during channel time V1 and the remainder of



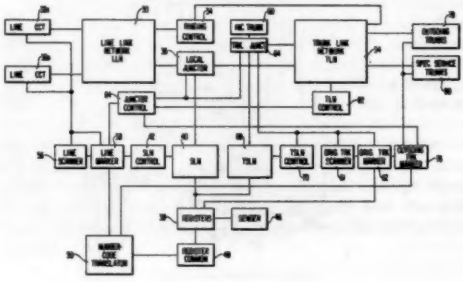
the odd numbered analog input signals coupled thereto during the remainder of the odd numbered channel time slots. A delay arrangement is coupled to the output of the coder so that the output code occuring is channel time V0 is delayed to occur in time slot V1 thereby leaving the even numbered channel time V0 and V16 for the transmission of signalling and synchronization codes.

3,732,377

OUTGOING TRUNK MARKER

Otto Altenburger, and David W. Stoddard, both of Rochester, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,267
Int. Cl. H04q *3/54*
U.S. Cl. 179—18 R **18 Claims**

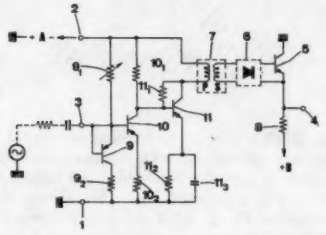


A marker circuit, particularly an outgoing trunk marker, provides marking signals, and other signals for servicing a plurality of equipment. For outgoing trunk marking purposes, battery marking signals are employed to mark a designated outgoing trunk group out of up to 100 groups on a time division multiplex basis. Revertive and paystation call features, in addition to fault detection circuitry are also incorporated into the marker.

3,732,378
PROCESS AND APPARATUS FOR THE REGENERATION OF RECTANGULAR SIGNALS

Robert Jean Chaumont, Sceaux, and Gilbert Louis Bargeton, Paris, both of France, assignors to Societe dite: Societe Anonyme de Telecommunications, Paris, France

Filed March 17, 1971, Ser. No. 125,041
Int. Cl. H04m *1/36;* H04l *27/06*
U.S. Cl. 179—16 EA 10 Claims

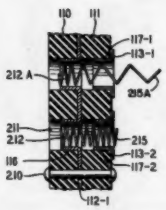


The present invention relates to a process and a transistorized device for improving the reproduction of the duration of successive signals of a train of impulses such as are utilized, for example, in automatic telephonic systems for the transmission of call signals on each of the channels of a carrier current multiplex signal in which the rectangular signals of a train of rectangular impulses are generated by modulating the amplitude of a sinusoidal wave, the frequency of which is high by comparison with the recurrence frequency of said impulses, and in which the duration of the regenerated impulses is determined by the time-interval between the passage of a threshold value by an impulse, on one hand, when that impulse passes from zero to maximum value and, on the other hand, when that impulse passes from its maximum value to zero, while according to the invention, the threshold value is varied in the same direction as the variations in its maximum value of this impulse during the time this impulse passes from maximum value to zero.

3,732,379
DISTRIBUTION BOARD

Joseph Patrick Focarile, Tennent, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed March 23, 1971, Ser. No. 127,139
Int. Cl. H04q *1/14*
U.S. Cl. 179—91 5 Claims

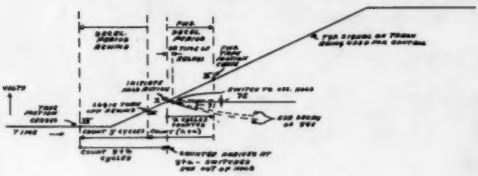


A main distributing frame for a telephone central office is disclosed in which quasi-permanently wired cross-connections may be automatically effected or removed. Connections are made by inserting a coiled, spring-like conductor into a recess equipped with the terminals between which a connection is to be completed. After being inserted to the proper depth, the conductor is allowed to partially unwind thereby allowing it to make a wiping engagement with the terminals in the recess. Connections are taken down by grasping one end of the coiled conductor and pulling it out of the recess in such a manner that it tends to unwind as pulled. Advantageously both the insertion and removal of the coiled conductors may be made by automatically controlled means. Removed conductors may be discarded.

3,732,380
SAMPLE AND HOLD REMOTE CONTROL FOR FM TAPE DECKS

Robert L. Kimball, 725 Saddlewood Avenue, Dayton, Ohio

Filed Jan. 4, 1972, Ser. No. 215,346
Int. Cl. G11b *15/20*
U.S. Cl. 179—100.2 B 5 Claims

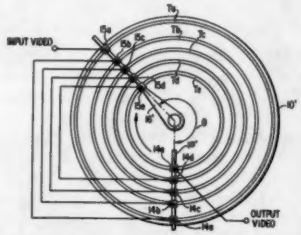


When the hold button is pushed the signals to the FM discriminators are switched from the signals on the tape to the signals from the record oscillators, which are tracking the signals on the tape (the recording heads are disconnected), and the output from the record oscillators provide constant hold signals. As the tape coasts to a stop the cycles of FM signal on the tape are counted by a counter. When the tape is rewound the total number of FM cycles the tape runs (including in the backward direction rewind coast) is counted. Then when the tape is placed in forward position again when the position on the tape passes the playback heads at which the hold was initiated the held signals are removed and normal operation continues from substantially the position at which the hold was initiated.

3,732,381
SYSTEM FOR CORRECTING FOR DOPPLER SHIFT FREQUENCY ERROR OF TRANSMITTED SIGNALS

George F. Newell, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

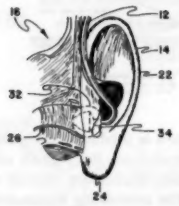
Filed Sept. 24, 1970, Ser. No. 75,197
Int. Cl. G11b *5/52, 21/00*
U.S. Cl. 179—100.2 K 2 Claims



A system for correcting the error in frequency of color television signals received from space vehicles resultant from a Doppler shift in frequency from the desired frequency of the signals as initially transmitted. A rotating magnetic recording disk includes two magnetic recording heads positioned at the same radius and angularly separated relative to the axis of rotation of the disk for communicating with a common recording band of the disk. The received signal is recorded by one head and read by the other, one head being fixed in position and the other being angularly movable about the disk to

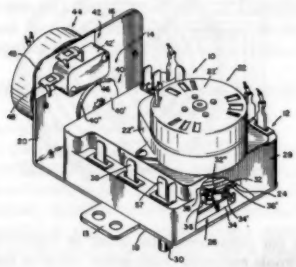
provide a time delay of controllable duration of the signal, between recording and reading thereof. Means are provided for adjusting the rate of change of the angular separation of the heads as a function of the Doppler shift frequency error, thereby to produce an output signal from the read head of the desired initial frequency. An embodiment with a plurality of heads in cascade is included.

3,732,382
HEARING AID EAR PIECE
William L. DeWitt, P. O. Box 518, Roscommon, Mich.
Filed Nov. 1, 1971, Ser. No. 194,267
Int. Cl. H04r *1/10*
U.S. Cl. 179—182 R 9 Claims



A relatively light weight plastic ear piece having a spherical configuration as positioned in the interior portion of the concha behind the tragus over the auditory canal orifice. The diameter of the ear piece is large enough to permit snug engagement between the tragus and concha while preventing it from wedging in the auditory canal, so that a clearance exists between the canal and the atmosphere to prevent pressure differentials therebetween.

3,732,383
MULTIPLE INTEGRAL TIMERS WITH IMPROVED HOUSING SUPPORT PLATE
Elmo W. Voland, Indianapolis, and Noel C. Mullikin, Beech Groove, both of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Filed Sept. 28, 1970, Ser. No. 75,854
Int. Cl. H01h *43/10*
U.S. Cl. 200—38 R 2 Claims

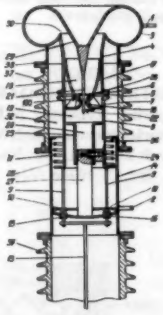


At least two timing mechanisms are carried by a single base member. Each of the timing mechanisms include program means responsive to constant speed drive means, switch means responsive to the program means, electrical terminals electrically connected to the switch means, and electrical leads electrically connecting the timing mechanisms together.

3,732,384
LINEAR SWITCH
Gustave Fischel, 1064 South Holt Avenue, Los Angeles, Calif.
Filed June 29, 1971, Ser. No. 157,932
Int. Cl. H01h *13/16*
U.S. Cl. 200—86 R 1 Claim

A linear switch having a pair of elongated superposed metal strip conductors positioned within a centrally located cavity formed within a resilient nonconductive casing. The lower conductor strip is supported within the cavity by a longitudinally extending rib or anvil-like portion which is integral with the casing. The upper conductor strip is supported within the cavity in a normally spaced relationship with the lower conductor strip by a pair of yieldable flanges which are integral with the casing and which protrude into the cavity a limited distance.

3,732,385
GAS-BLAST SWITCH
Viktor Herbert Stephanides, 8002 Zurich, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland
Filed March 6, 1972, Ser. No. 232,125
Claims priority, application Switzerland, May 5, 1971, 6650/71
Int. Cl. H01h *33/82*
U.S. Cl. 200—148 R 5 Claims

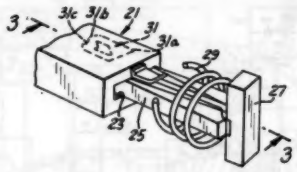


A gas-blast switch comprising a switching pin and an electrode having a burning-off surface, the switching pin and electrode being electrically conductively connected with one another when the switch is in a closed condition. Drive means serve for carrying out relative separation movement of the switching pin and electrode away from one another during switching-out or disconnection of the gas-blast switch in order to extend or draw in the lengthwise direction the arc prevailing between the switching pin and the electrode during such separation movement, the arc being flushed by a flowing stream of extinguishing gas. The burning-off surface of the electrode is arranged in a widened discharge channel of a Laval nozzle directly after the narrowest location or throat of such nozzle, the switching pin during the switching-out operation being retracted in the flow direction of the extinguishing gas into the discharge channel of the Laval nozzle.

3,732,386
ALTERNATE ACTION SWITCH WITH BINDING PREVENTING ARRANGEMENT

Masao Ohkita, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed April 1, 1970, Ser. No. 24,656
Claims priority, application Japan, April 25, 1969, 44/37786
Int. Cl. H01h *13/56*
U.S. Cl. 200—153 J 11 Claims

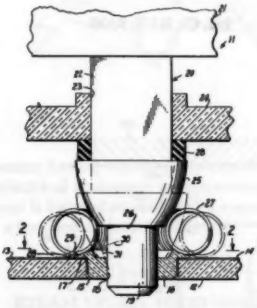


A pushbutton switch in which the pushbutton, when pushed, will alternate between an outer position and an inner position, the structure for effecting this movement exerting a minimal frictional force on the pushbutton of the switch as it moves from one operative position to the other and being so arranged as not to take up any more space than the switch proper. A heart-shaped channel is formed on an inner wall of the pushbutton body, a driving member is carried by the push rod and has a part received in that channel so as to operatively coact therewith, and a spring is mounted on an end of the switch body so as to engage and slide over the driving member as the pushbutton moves while at the same time urging the driving member against the push rod. Preferably the push rod is provided with a channel within which the driving member is received, thereby to further minimize the space taken up by the operating parts.

3,732,387
KEY SWITCH

William A. Berry, Covina, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Oct. 22, 1971, Ser. No. 191,915
Int. Cl. H01h *1/20*, *13/52*
U.S. Cl. 200—159 R 5 Claims

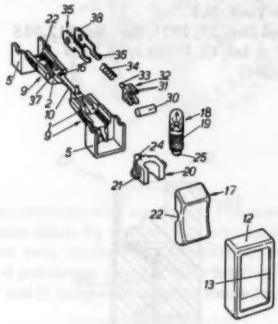


A key switch incorporated with a printed circuit board having conductors thereon and a bearing member loosely fitted in a hole formed between adjacent terminal ends of the conductors. A depressible key is slideable in the bearing member and has a generally conical surface engaging an expandable toroidal contact spring member which rests on an outwardly tapering surface of the bearing member. As the key is depressed the conical surface thereof expands the spring member downwardly over the surface of the bearing member and into bridging contact with the conductors.

3,732,388
UNITARY INSULATING HOUSING FOR ROCKER SWITCHES

William Eric Taylor, Walsall, England, assignor to George Turnock Limited and Henry Charles Shelton, London, England

Filed July 26, 1971, Ser. No. 166,042
Claims priority, application Great Britain, July 29, 1970, 36,601/70
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 C 9 Claims

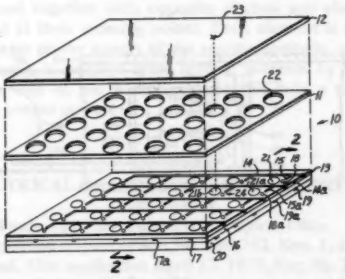


A rocker switch has a rocker housing and a cylindrical switch housing extending from the rocker housing. A switch mechanism is mounted in the switch housing and is operated by a rocker mounted at least partially within the rocker housing to pivot about an axis. The cylindrical switch housing is smaller than the rocker housing so that the switch housing can be inserted in a hole in a face to project through the hole and be located with the rocker housing abutting the face. Also the two housings are formed as integral parts of a switch body comprising a pair of moulded shells arranged on opposite sides of a plane including the axis of the cylindrical switch housing.

3,732,389
TOUCH ENTRY SWITCH ARRAY

George R. Kaelin, and David M. Piatt, both of Woodland Hills, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 14, 1972, Ser. No. 225,826
Int. Cl. H01h *9/16*
U.S. Cl. 200—167 A 6 Claims



A touch entry switch array comprising a layer of non-conductive material is sandwiched between two conductive layers. Orthogonally disposed conductors are arranged in a matrix and adapted to make electrical connection by deforming an upper resilient, transparent or translucent layer through respective apertures to establish electrical contact. Indicator means is provided to indicate through the apertures the actua-

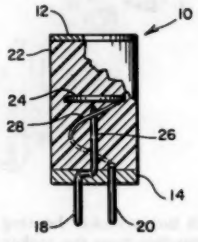
tion of the associated switch. In one form of the device, the orthogonal conductors are supported on the lower layer and the upper layer is constructed of transparent or translucent conductive material which may be deformed through the apertures to operate the associated switch. In another form of the invention, one set of conductors is supported on the upper layer to be deformed through the apertures to contact conductors on the lower layer.

3,732,390

KEYSWITCH

Phillip J. Novak, Granger, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,015
Int. Cl. H01h *3/12, 9/04*
U.S. Cl. 200—168 G **2 Claims**



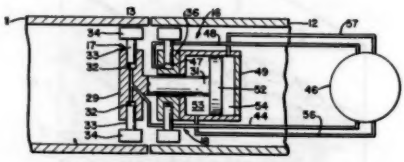
An electromechanical switch that includes a floating contact suspended in an elastic material above a fixed contact is disclosed. Finger pressure compresses the elastic material forcing the floating contact to make electrical contact with the fixed contact completing the switch circuit.

3,732,391

METHOD OF SOLID PHASE WELDING FOR PIPES

Jean La Force, P.O. Box C, Inverness, Calif., and Carl Stringer, P.O. Box 755, Pearland, Tex.

Filed June 1, 1971, Ser. No. 148,572
Int. Cl. B23k *31/06*
U.S. Cl. 219—67 **2 Claims**



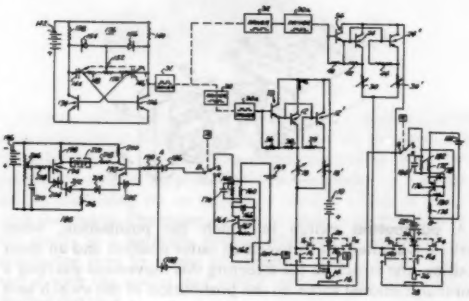
Solid phase or pressure welding of adjacent pipe ends is accomplished by placing a pair of expandable elements maintained in axial alignment within the pipe ends and radially expanding the elements into firm grasping relationship with the interior bore walls of the respective pipe ends. Thereafter, the elements are axially moved together to place and hold the pipe ends in axially aligned abuttment and create upset pressure in the region of the abutting ends while heat is applied thereto to produce a solid phase welded joint between the pipe ends.

3,732,392

POLARITY REVERSAL SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Dalton R. Verner, Orchard Lake, Mich., assignor to Elox Inc., Davidson, N.C.

Filed March 10, 1971, Ser. No. 122,830
Int. Cl. B23p *1/08, 1/14*
U.S. Cl. 219—69 C **19 Claims**



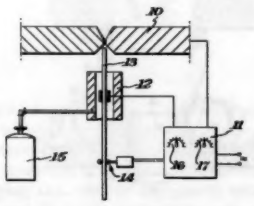
A control system is provided with an electronic switch control network for maintaining a constant polarity gap output signal from a single or multiple electrode gap system independently of whether the electrical power conducting leads from the power source are connected to one or the other of the EDM gap elements. The gap output signal which is ordinarily representative of gap voltage is then utilized in other associated EDM circuits such as for an example power feed control networks and machining pulse cut-off control networks to regulate their operation.

3,732,393

ELECTRIC ARC WELDING PROCESS

Gunther Wilkens; Hansfriedrich Lehmler, and Alfred Krahl, all of Frankfurt/Main, Germany, assignors to Messer. Griesheim GmbH, Frankfurt/Main, Germany

Filed Aug. 31, 1971, Ser. No. 176,578
Claims priority, application Germany, Sept. 3, 1970, P 20 43 640.2
Int. Cl. B23k *9/00*
U.S. Cl. 219—137 **10 Claims**



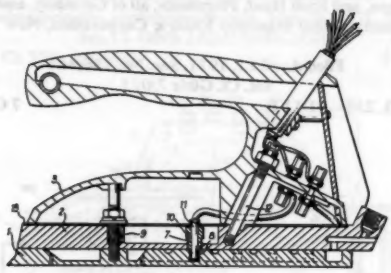
An electric arc welding process for welding together sheets of unalloyed or low alloyed structural steel utilizes a consumable wire electrode under shielded gas and is characterized in that the welding is conducted with a voltage of 25 to 40 V at a current density of 300–400 A/mm² wire electrode cross-section with the wire electrode having a diameter of about 0.8–1.2 mm and the shielded gas containing at least some CO_2.

3,732,394

IRON

Maurice Cusworth, Garforth, near Leeds, England, assignor to Issaac Braithwaite & Son Engineers Ltd., Kendal, Westmoreland, England

Filed Feb. 17, 1971, Ser. No. 115,979
Claims priority, application Great Britain, Feb. 19, 1970, 7,905/70
Int. Cl. D06f *75/26*
U.S. Cl. 219—251 6 Claims



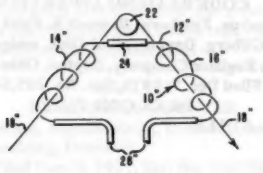
An iron including heating means and a sole plate wherein means for controlling the heating means is provided in the sole plate.

3,732,395

YARN HEATER

Israel A. David, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 22, 1971, Ser. No. 155,465
Int. Cl. F27b *9/06*
U.S. Cl. 219—388 2 Claims



A yarn heater having substantially equidimensional, coiled lengths of electrical resistance wire interconnected by a coil-reversing loop is located coaxially of a running yarn and does not require a free end of yarn for stringup.

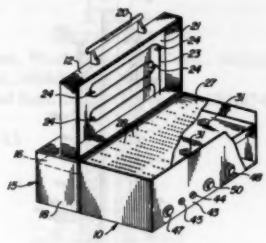
3,732,396

STEAM VESSEL FOOD WARMER

Jacob S. Tucker, 4421 Granada Boulevard, Apt. 322, Warrensville Heights, Ohio

Filed Sept. 13, 1971, Ser. No. 179,704
Int. Cl. F27d *11/02*
U.S. Cl. 219—401 8 Claims

Steam heating apparatus for heating frozen and refrigerated foods to render them appetizing both in appearance and taste. Long and short steam heating periods are provided as well as a sear heater for browning meat, bread and the like. A short or long period of steam heating operation is initiated by depressing an appropriate switch associated with a timer which in turn controls a time delay relay. The second time delay relay controls operation of a motor driven pump which pumps water during a given interval to atomizing nozzles. The atomizing nozzles are mounted on a lower heating plate in a steam housing and direct atomized water droplets to an upper heated plate provided with apertures. The water droplets are converted into steam by contact with one or both of the hot plates. Steam rises through the apertures in the top plate to heat the food positioned thereon. Sear heating is controlled by a sear timer and is independent of the steam heating cycles.

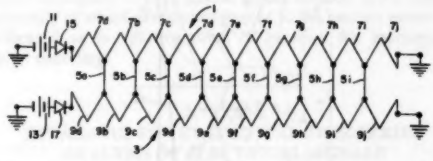


3,732,397

INHERENT REDUNDACY ELECTRIC HEATER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Bruce H. Kernodle, Palm Beach Gardens, Fla.

Filed March 30, 1972, Ser. No. 239,576
Int. Cl. H05b *1/02*
U.S. Cl. 219—477 9 Claims



A cross-wound electrical heater comprising two resistance coils wound together with opposite pitches and electrically connected at their crossing points. Each element is supplied by a separate power supply of the same magnitude, and each power supply is isolated from reverse currents by a diode. Failure of one of the windings results in only a moderate change in output power.

3,732,398

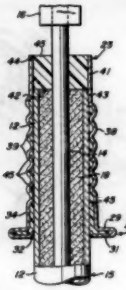
ELECTRICAL HEATING ELEMENT AND FITTING ASSEMBLY

James F. Pease, 100 View Point Drive, Dayton, Ohio

Continuation-in-part of Ser. No. 194,742, Nov. 1, 1971, abandoned. This application April 17, 1972, Ser. No. 244,516
Int. Cl. H05b *3/06*
U.S. Cl. 219—536 9 Claims

A heating element includes an elongated tubular sheath which confines a resistance wire supported by a thermally conductive electrical insulation material which extends to a position flush with the end surface of the sheath. Each end portion of the heating element is supported by a bulkhead fitting which is formed of sheet metal and includes a tubular wall portion having helical convolutions defining external

threads. A radial flange portion projects outwardly from the tubular wall portion and forms an annular tapered hub portion firmly engaging the outer surface of the sheath. The flush end surfaces of the insulation material and the sheath are spaced



inwardly from the end surface of the fitting to define a cavity, and a thermosetting sealant material is disposed within this cavity and the space defined between the outer surface of the sheath and the helical convolutions.

3,732,399

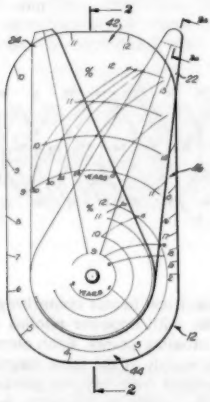
COMBINED OVAL SLIDE RULE AND NOMOGRAPH

Donald G. Finley, 1658 Morse Drive, San Pedro, Calif

Filed Feb. 28, 1972, Ser. No. 229,945

Int. Cl. G06k *1/00*

U.S. Cl. 235—61 B **5 Claims**



A calculating device comprising a flat generally oval-shaped card member having a perimeter defining somewhat semicircular sections interconnected by a central elongated section. The central section is formed of a generally straight periphery. A pair of indicating arms are rotatable about a pivot point on the member. The pivot point may be along the longitudinal axis of the card member, and offset from the center of the member. In addition, a scale may be printed on one side of the periphery of the member. Moreover, the semicircular sections can be identical in size, and a scale printed on the other side of the member and adjacent the periphery of the member may be the reciprocal of the scale on the first side. In addition, the calculating device may be used as a loan payment computer for determining the periodic payments due on a predetermined loan. By providing the card member with a plurality of interest rate curves which are juxtaposed with a plurality of loan duration curves, the scale may be representative of periodic payments. Thus, by positioning one of the indicia arms at the intersection of the desired interest rate and loan duration, the resultant position on the scale would be representative of the periodic payment for the intersecting interest rate and loan duration.

3,732,400

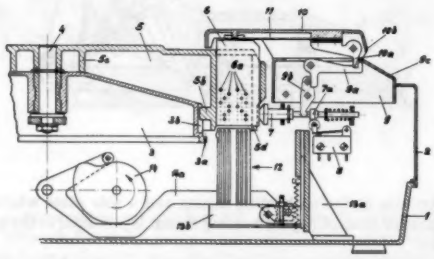
PUNCHED CARD READER WITH A DRUM-SHAPED, ROTATABLE CARD MAGAZINE

Bernhard Cramer, Pforzheim-Sonnenberg; Heinrich Deimling, Singen, and Rudi Hauf, Pforzheim, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed April 22, 1971, Ser. No. 136,464

Int. Cl. G06r *7/015*

U.S. Cl. 235—61.11 B **7 Claims**



A punched card reader wherein the cards are received in a horizontally arranged exchangeable carousel-type cassette which is provided, at its outer rim, with radial guide slots to be fed from above. The cards are evaluated by a contact spring set arranged below the path of rotation of the cards, which is vertically adjustable. It reads the cards successively during the periods of rest in a step-by-step reading cycle.

3,732,401

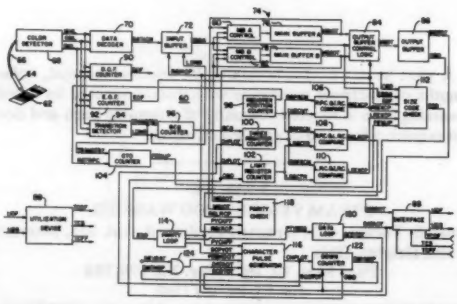
CODE READING APPARATUS

James P. Donohue, Fairborn; Ramesh S. Patel, Kettering, and Robert C. Gilberg, Dayton, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Dec. 7, 1971, Ser. No. 205,544

Int. Cl. G06k *7/12*

U.S. Cl. 235—61.11 E **6 Claims**



A system for processing a color bar code read optically from a coded medium is disclosed. The system includes logic for determining the binary code from color signals and storage means for temporarily storing the binary code. Logic is also provided which allows the reading of a double field tag and

which checks the parity and the size of the captured message. Further, logic is provided for transmitting the captured message to a utilization device.

3,732,402

ELECTROMECHANICAL DEVICE FOR TAPE WINDING MECHANISM

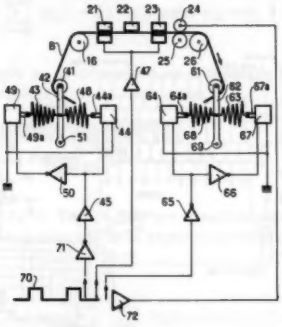
Marcel-Louis Boyer, Chatillon, France, assignor to Compagnie Industrielle des Telecommunications Cit-alcatel, Paris, France

Continuation-in-part of Ser. No. 136,496, April 22, 1971. This application May 30, 1972, Ser. No. 257,900

Claims priority, application France, May 26, 1971, 7119073

Int. Cl. G06k *13/26*; B65h *23/08*

U.S. Cl. 235—61.11 R 9 Claims



An electromechanical device for a tape winding mechanism which adapts the step-by-step advance at very high speed and at low inertia to the control of the winding and unwinding spools which have a great inertia, in the case where the band must be periodically stopped for an instant, including lightweight pulley arrangements responsive to starting and stopping operations for automatically providing the required slack in the tape to overcome the difficulties created by the high inertia of the spools and wherein vibrations in the pulley arrangements are reduced to the maximum possible extent by the provision of pairs of coil spring members connected between the actuating solenoids and the pivot arms for the pulleys so that the required slack in the tape can be provided at high speed without harmful vibration.

3,732,403

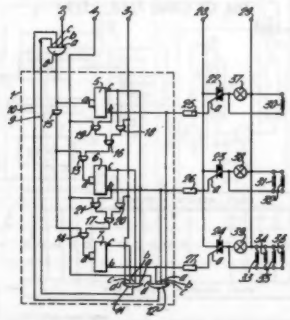
REVERSIBLE COUNTER

Flemming Thorsoe, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 8, 1971, Ser. No. 196,594

Int. Cl. H03k *21/30*

U.S. Cl. 235—92 PE 8 Claims



The invention relates to a reversible counter to which count-up and count-down impulses can be fed. Blocking means is provided in which the exceeding of the upper and lower limits of the counter is prevented. The blocking means is incorporated in a NAND element associated with the impulse input. The blocking means is influenced by the outputs of the binary stages of the counter being monitored and by the counting direction signal.

3,732,404

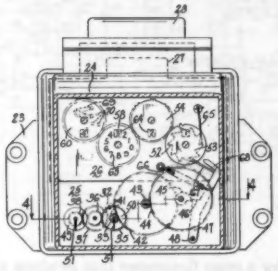
METER DEVICE

Charles L. Jones, West Hartford, Conn., assignor to Ripley Company, Inc., Middletown, Conn.

Filed Sept. 20, 1971, Ser. No. 181,674

Int. Cl. G06c *27/00*

U.S. Cl. 235—113 9 Claims



A meter device for electrically reading incremental positions wherein the continuous rotation of a drive armature is converted to intermittent incremental rotation by a mechanism including a jumping cam, a lever arm having a cam follower responsive to the cam, a drive pawl member, a check pawl member which prevents forward motion of the ratchet wheel subsequent to each advancement by the drive pawl member, a detent for arresting reverse motion of the ratchet wheel subsequent to each advancement thereof, and including a plurality of wheel assemblies geared to the ratchet wheel and calibrated as to relative rates of rotation for incremental digital encoding.

3,732,405

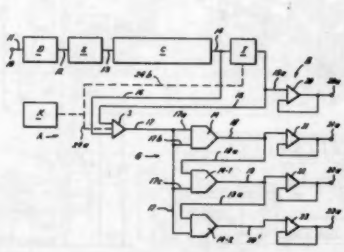
APPARATUS FOR STATISTICAL TIME-SERIES ANALYSIS OF ELECTRICAL SIGNALS

Carrington H. Stewart, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 11, 1971, Ser. No. 170,681

Int. Cl. G06g *7/62*

U.S. Cl. 235—151.31 9 Claims

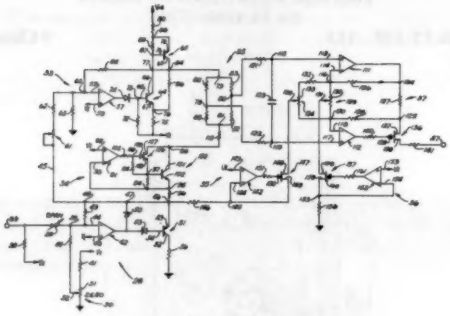


An apparatus for performing statistical time-series analysis of complex electrical signal waveforms, permitting prompt and accurate determination of statistical characteristics of the signal.

3,732,406
ANALOG MULTIPLIER AND SQUARE ROOT EXTRACTOR HAVING A PLURALITY OF STRAIN GAGES CONNECTED IN A BRIDGE CIRCUIT

Gerald Lance Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 8, 1971, Ser. No. 160,750
Int. Cl. G06g *7/16, 7/20, 7/57*; **G01l** *1/22*
U.S. Cl. 235—151.34 **11 Claims**

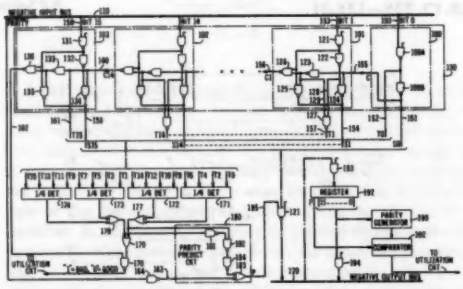


Computers for a mass flowmeter that produce a total pulse output directly proportional to total mass flow. Differential pressure (DP) unit and densitometer analog outputs are multiplied by passing a density current analog through the unit strain gage bridge. A square root extractor incorporating three integrators utilize the positive and negative sawtooth outputs of two integrators alternately as an input to the third. The absolute values of the sawtooth slopes is directly proportional to the DP-density product. The output of the third integrator is level detected to switch the two integrators on and off. The switching frequency is then directly proportional to the square root of the DP-density product, and the total switching count is directly proportional to the total mass flow.

3,732,407
ERROR CHECKED INCREMENTING CIRCUIT

John Holt Brewster, Wheaton, and Ted Leroy Hoffman, Aurora, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 12, 1971, Ser. No. 198,211
Int. Cl. G06f *11/10*
U.S. Cl. 235—153 BB **5 Claims**

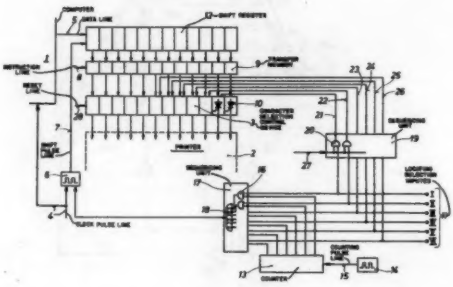


An add-one circuit having an error checking arrangement in which common circuits are employed to predict the parity of the output word of the add-one circuit and to assure that a single "0" to "1" transition occurs during each incrementing operation. Single errors in the operation of the add-one circuit are fully detected by utilization of the transition detecting circuitry in combination with arrangements for comparing the predicted parity with the actual parity of the output word.

3,732,408
OUTPUT DEVICE FOR ELECTRONIC DATA PROCESSING SYSTEMS

Hubertus Bettin, Braunschweig, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed March 16, 1971, Ser. No. 124,768
Claims priority, application Germany, March 16, 1970, P 20 12 305.1
Int. Cl. B41j *5/00, 5/04*; **G06f** *5/02*
U.S. Cl. 235—155 **5 Claims**

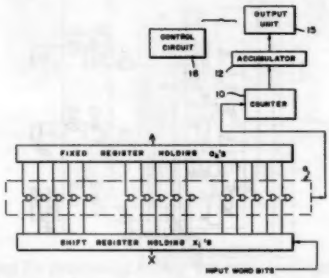


In a system for converting binary data into a decimal readout and in which the bits of a succession of binary words are fed in series into a shift register and fed out therefrom in parallel to control the selection of each decimal digit of the readout, a circuit for controlling the insertion of a decimal point at a selected location of the decimal readout by the application of a signal to a selected one of a plurality of selection inputs each corresponding to a respective location of the decimal readout, the circuit applying an additional shift pulse to the shift register for preventing the storage of a data bit in the shift register location corresponding to the selected decimal readout location and triggering the insertion of a decimal point at the selected readout location.

3,732,409
COUNTING DIGITAL FILTERS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Shalhav Zohar, Sunland, Calif.

Filed March 20, 1972, Ser. No. 236,285
Int. Cl. G06f *7/38, 15/34*
U.S. Cl. 235—164 **24 Claims**



Several embodiments of a counting digital filter of the nonrecursive type are disclosed. In each embodiment two re-

gisters, at least one of which is a shift register, are included. The shift register receives J_x-bit data input words bit by bit. The kth data word is represented by the integer

$$x_k = \sum_{j=0}^{J_x-1} v_{kj}(-2)^j, \text{ wherein } v_{kj}=0, 1$$

In the shift register wherein the data words are fed in a monotonic word index sequence, they are separated by J_a-1 spacing zero bits, where J_a represents the number of bits of each of K filter coefficients stored in the other register. The kth filter coefficient is represented by the integer

$$a_k = \sum_{j=0}^{J_a-1} u_{kj}(-2)^j \text{ wherein } u_{kj}=0, 1$$

An output sample y_m is computed as a function of J components in accordance with the expression

$$y_m = \sum_{r=0}^{J-1} (h_r)_m(-2)^r$$

J is equal to J_a+J_x-1. The $(h_r)_m$'s are functions of the bits of the coefficients and data words in accordance with the expression

$$(h_r)_m = \sum_{k=0}^{K-1} \sum_{j=0}^{J_x-1} u_{kj}v_{m-k,r-j}$$

Since the products in the last expression involve binary quantities only, each of them is determined as the output of a two-input AND gate. The double summation is carried out simply by counting all TRUE AND gates.

3,732,410

SELF ADAPTIVE FILTER AND CONTROL CIRCUIT THEREFOR

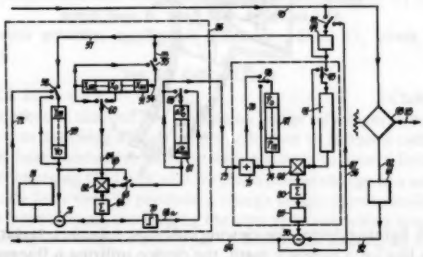
Laurence Kenneth Mackechnie, Granger, Ind., assignor to Commonwealth of Australia, C/-Postmaster-General's Department Research Laboratories, Melbourne, Australia

Filed Dec. 16, 1970, Ser. No. 98,800

Claims priority, application Australia, Dec. 22, 1969, 65671/69

Int. Cl. G06f *15/34*; H04b *3/20*

U.S. Cl. 235—181 **25 Claims**



A self-adaptive filter control circuit which operates to compute alterations to the impulse response of a network to alter that impulse response so that it bears a predetermined relationship to the impulse response of another network, the circuit operating to compute alterations by a process in which a first value of an error function, taken by sampling signals related to the networks and being indicative of the state of divergence of the impulse responses from the predetermined relationship, is used to compute a necessary adjustment to the impulse response of the first network, and the value of the error function is progressively reduced by computation and by successive applications of computed alterations.

3,732,411

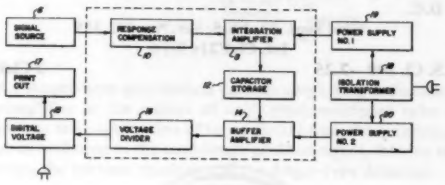
SIGNAL INTEGRATING, STORING AND ANALYZING CIRCUIT

Courtland C. Galeener, Oklahoma City, Okla., assignor to Wilson Certified Foods, Inc., Oklahoma City, Okla.

Filed June 17, 1971, Ser. No. 154,121

Int. Cl. G06g *7/18*; G01n *31/08*

U.S. Cl. 235—183 **12 Claims**



A circuit for integrating, storing and analyzing a signal having a plurality of peaks, such as the output of a gas chromatographic detector, in which each of a plurality of storage capacitors is successively connected to an integrator for storing each signal peak integrated. The signals being integrated may be compensated in order that the stored integrals are all on the same basis, e.g., weight percent. After storage of all of the integrals, the total integral and each of the individual integrals may be read out through a buffer which operates to inhibit discharge of the storage capacitors during readout. A voltage control circuit applies a signal to the input of the buffer approximately equal to the value of the total integral to inhibit transients during readout. The values of the stored integrals may be read out in absolute or relative units, for example, each individual integral may be read out as a percentage of the value of the total integral.

3,732,412

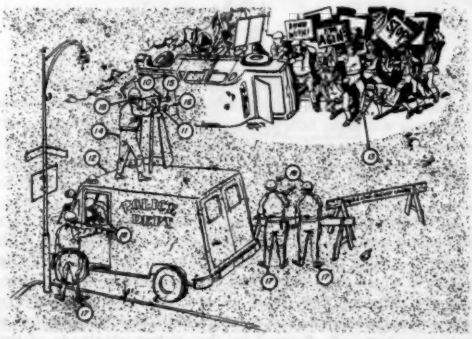
METHOD AND SYSTEM FOR PERSONNEL CONTROL WITH BLINDING ILLUMINATION

Jesse F. Tyroler, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed June 13, 1972, Ser. No. 262,405

Int. Cl. F21

U.S. Cl. 240—1 R **2 Claims**



Unruly personnel, e.g. rioters, are subjected to continuous low intensity illumination of one part of the visible spectrum,

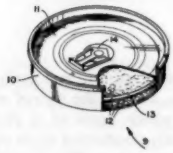
which is sufficient for identification purposes, simultaneously with flashes of high intensity light of a different part of the visible spectrum, the latter is sufficient to blind the eye temporarily to the low intensity illumination and cause movements to appear confused and chaotic in the flashing high intensity illumination, whereby the activity of the crowd is inhibited or arrested. Police equipped with goggles, which are transparent to the continuous low intensity illumination but opaque to the flashing high intensity illumination, can see adequately under such conditions to remove individual agitators.

3,732,413

LIGHT PRODUCING DEVICE

Sydney Shefler; Steven M. Little, both of China Lake, Calif.; James H. Mills, Las Cruces, N. Mex., and Lee E. Humiston, China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 30, 1965, Ser. No. 492,359
Int. Cl. F21v *9/16*
U.S. Cl. 240—2.25 **2 Claims**



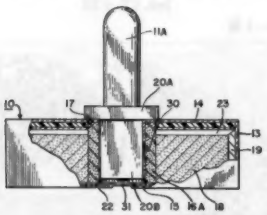
A hermetically sealed aluminum container provided with a pull-tab means for admitting air and a cotton wick soaked with tetrakis (dimethylamino)ethylene which when exposed to air produces a blue-green light. The device is a reliable map-reader or a non-beaming flashlight.

3,732,414

PORTABLE ILLUMINATION DEVICE

Charles Franc, Box 36-R Wading River P.O., Long Island, N.Y.

Filed March 19, 1971, Ser. No. 125,980
Int. Cl. F21l *7/00*
U.S. Cl. 240—10.61 **3 Claims**



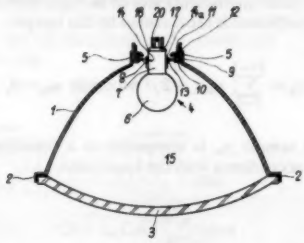
A portable illumination device consisting of a substantially flat battery having a top and bottom surface and having a bulb receiving means provided substantially in the center of the battery in which the positive and negative terminals of the battery are disposed. The bulb receiving means comprises a socket which is disposed co-axially within, and may be a metal socket, or integrally formed in, the carbon electrode of the battery. The socket forms the positive terminal of the battery, while a zinc can surrounding the battery forms the negative electrode.

3,732,415

HEADLIGHT CONSTRUCTION

Gerhard Lindae, Leonberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 25, 1970, Ser. No. 75,503
Claims priority, application Germany, Oct. 15, 1969, P 19 51 978.9
Int. Cl. F21v *13/04*
U.S. Cl. 240—41 SC **10 Claims**



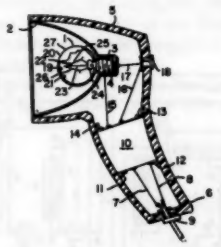
A cupped reflector is provided in its crown with an opening and has an open side opposite the crown. Its inner reflecting surface is to be protected against deleterious matter in the ambient temperature. A lens seal-tightly closes the open side and an incandescent bulb is received in the reflector and includes a socket lodged in the opening of the crown and having a radially projecting circumferential flange encircling and seal-tight with the socket. Mounting means removably mounts the bulb in the opening in seal-tight cooperation of the socket and flange with the reflector so that the interior of the reflector is pressure-tightly and seal-tightly closed with respect to the ambient atmosphere.

3,732,416

DISCLOSING LIGHT

Emery G. Audesse, Salem; Arnold E. Westlund, Jr., Manchester, and Tadius T. Sadoski, Salem, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 26, 1971, Ser. No. 202,538
Int. Cl. A61b *1/06*
U.S. Cl. 240—41.15 **2 Claims**



A lighting device for viewing calculus, (plaque), tartar, and the like on a person's teeth, the device utilizing a fluorescent lamp with a phosphor such as calcium strontium magnesium silicate, activated by europium, to emit light mainly in the 400 to 520 nanometers wavelength region, that is in the blue and green region, but not the yellow, to produce a yellow fluorescent emission from any calculus or tartar on the teeth. The teeth are first treated with a fluorescent material such as a weak sodium fluorescein solution to provide the calculus with phosphor material. In viewing, it is best to use a filter which excludes blue and green light in order to make the amount of

reflected light from the part of the teeth which do not have calculus on them as small as possible. This can be done by viewing the teeth in a dichroic reflector which passes blue and green but reflects yellow. The device can also be used for viewing other parts of the body, and for other purposes.

3,732,417

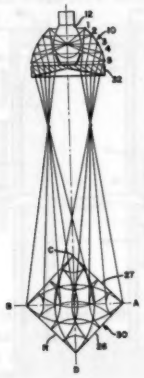
SQUARE LITE PROJECTOR USING PRISMATIC LENS

Robert G. Nordquist, deceased, late of Springfield, Ohio (by Mattie L. Nordquist, executrix), assignor to Grimes Manufacturing Company, Urbana, Ohio

Filed June 16, 1971, Ser. No. 153,642

Int. Cl. F21v *13/04*

U.S. Cl. 240—41.3 **9 Claims**



A reflector and lens projecting assembly is adapted to project a rectangular or square pattern of light from a conventional circular reflector. A prismatic lens having four 90° segments is positioned in front of the reflector and directs the light from the reflector into four mutually over-lapping segments in which radii of the unmodified pattern from the reflector form the boundaries of the square or rectangular pattern as modified by the lens. Embodiments are shown using light modifying prisms in which the thick portions of the prism are at the periphery of the lens and in which the thick portions of the prism are at the center of the lens.

3,732,418

REPRODUCTION PROCESS USING INFRARED RADIATION

Erwin Lind, Wiesbaden-Biebrich, Germany, assignor to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Nov. 6, 1961, Ser. No. 150,141

Claims priority, application Germany, Dec. 17, 1960, K 42434

Int. Cl. G01n *21/34*

U.S. Cl. 250—65 T **2 Claims**

A method is disclosed of making an image on a layer, which comprises exposing a layer of polyethylene to infrared radiation in heat-conductive relation with a master to form a latent image, charging the layer with an electrostatic charge at a substantially later time to produce a charge image corresponding to the latent image, developing the charge image with a toner, and fusing the toner to said layer. A method of making an offset printing plate is also disclosed which comprises exposing a layer of cellulose acetate to infrared radiation in heat-conductive relation with a master to form a latent image corresponding to the master, charging the layer electrostatically at a substantially later time to produce a charge image, developing the charge image by applying a toner, fusing the toner to said layer and saponifying the surface of said layer to render the non-image areas hydrophilic thereby forming a layer suitable for use as an offset printing plate.

3,732,419

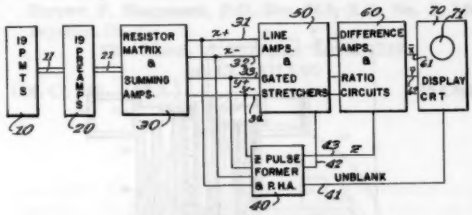
SCINTILLATION CAMERA WITH IMPROVED RESOLUTION

Gerardus H. Kulberg, Amstelveen, Netherlands, and Gerd. Muehllehner, Heidelberg, Germany, assignors to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Oct. 12, 1970, Ser. No. 79,861

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 S **13 Claims**



An Anger-type scintillation camera employing a threshold preamplifier at the output of each photomultiplier tube to eliminate the contribution of tubes distant from the location of each scintillation to the coordinate position signal, thereby improving the intrinsic resolution of the Anger-type detector.

3,732,420

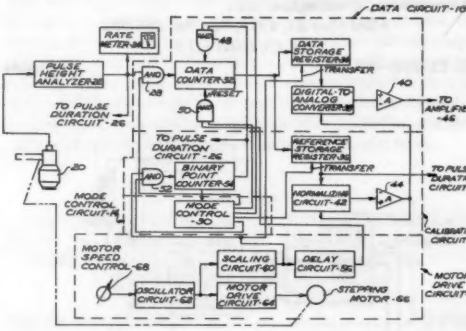
AUTOMATIC CALIBRATION SYSTEM FOR A SCINTILLATION DEVICE

Carl J. Brunnett, Mayfield Heights, and Basil N. Ioannou, Bedford, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed June 25, 1971, Ser. No. 156,912

Int. Cl. G01j *39/18*

U.S. Cl. 250—71.5 **15 Claims**

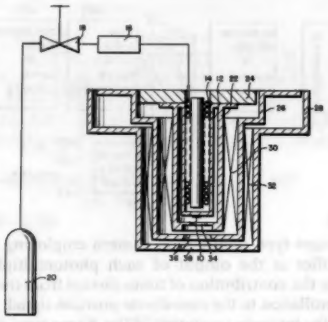


A scintillation device, such as a scintillation scanner, having a calibrate system for automatically calibrating the value of data signals representative of measured radiation activity in response to the value of reference signals representative of the level of maximum radiation activity, i.e., signals representative of radiation activity at a calibration point or a "hot spot." The calibrate system utilizes circuitry for counting the number of signals which occur at the calibration point for a predetermined number of intervals of time, and then dividing the number of counted signals by the number of intervals of time to develop calibration signals having a high degree of statistical accuracy. The values of the data signals obtained during the normal operation are then calibrated with reference to the calibrate signals to that the data signals always remain within a preselected range of values regardless of the levels of measured radiation activity.

3,732,421
COOLING APPARATUS

Wallace Y. Kunimoto, Goleta, and Joseph S. Buller, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 20, 1971, Ser. No. 145,363
Int. Cl. G01t 1/24
U.S. Cl. 250—83 R 10 Claims

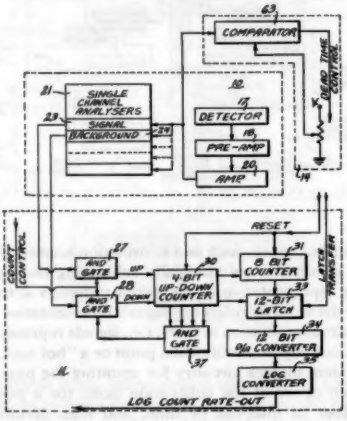


A dewar surrounding a cold region and attached to a radiating surface adapted to be directed toward dark space, whereby the dewar insulates the cold region from surrounding heat sources in an atmospheric environment, and it conducts heat away from the cold region to the radiating surface in a space environment.

3,732,422
COUNTER FOR RADIATION MONITORING

Glenn S. Brunson; Robert N. Curran, and Franklin H. Just, all of Idaho Falls, Idaho, assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed May 23, 1972, Ser. No. 256,062
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 R 7 Claims

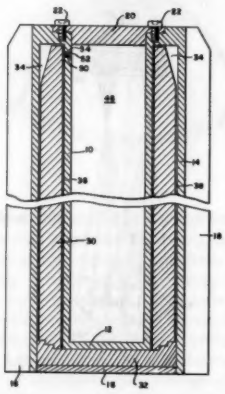


A radiation counter repeatedly takes periodic samples by counting radiation pulses which are received during a predetermined period. The predetermined period is measured by a timing circuit. An amplitude measuring circuit measures the amplitude of the incoming radiation pulses and acts to disable the timing circuit whenever a radiation pulse above a particular amplitude is received. By disabling the timing circuit, dead time, during which the counting circuit will not detect radiation pulses, is not counted as part of the predetermined counting period.

3,732,423
SHIPPING CONTAINER FOR RADIOACTIVE MATERIAL

Reuben W. Peterson, Wilmington, Del., assignor to National Lead Company, New York, N.Y.

Filed May 24, 1971, Ser. No. 146,010
Int. Cl. G21f 5/00
U.S. Cl. 250—108 R 4 Claims

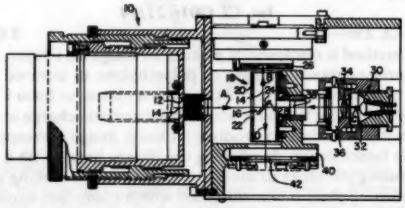


A body means includes inner and outer shell means having radiation shielding means therebetween and defining gaps at the interfaces between the shielding means and the shell means. Means is provided in said gaps having a thermal conductivity which is substantially greater than that of air and which inhibits corrosion of the radiation shielding means. Means is also provided for releasing the means in said gaps into the cavity within the body means at a predetermined temperature.

3,732,424
STAR TRACKING DEVICE

Waclaw Wojtulewicz, Paterson, N.J., assignor to The Singer Company, New York, N.Y.

Filed April 21, 1971, Ser. No. 136,009
Int. Cl. G01j 1/20
U.S. Cl. 250—203 R 5 Claims



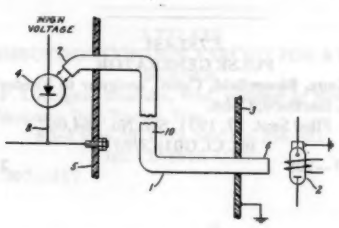
A star tracking device in which a source of light is moved across a detector by being reflected from the front reflecting surface of an oscillating reflector placed in the path of the light. The detector generates an output signal which corresponds to the place of incidence thereon of the reflected light. A signal corresponding to the angular position of the reflector is produced utilizing light reflected from the rear side

thereof. Electronic circuitry utilizes the detector output signal and the angular position signal to supply a signal which corresponds to the position of the source of light relative to the device. A torque motor, utilizing a bifurcated torsion-bar-mounted armature, is provided for oscillating the reflector and includes redundant electromagnets for supplying motive force.

3,732,425
LIGHT CONDUIT WITH DOUBLE CLADDING

Frederick J. Ellert, Broomall, and Bernard D. Leete, Newtown Square, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 18, 1970, Ser. No. 99,621
Int. Cl. G02b *5/14*; H01j *39/12*
U.S. Cl. 250—217 S **7 Claims**

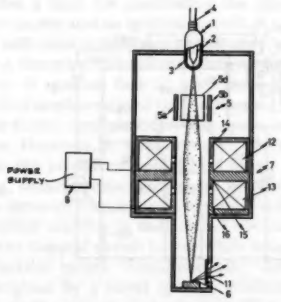


An optical fiber is provided with an extra outer layer or cladding of a material which is chemically stable and protects the less stable inner optical glass from the adverse effects of moisture or chemicals in the environment when the material is an electronically conducting glass and both ends of the fiber are at substantially different electrical potentials, current in the outer cladding supports resistance heating to prevent the accumulation of moisture. The conductivity of the glass prevents the formation of localized high potential gradients. The fiber is particularly useful in providing a light link between two electrical circuits which are at substantially different electrical potentials.

3,732,426
X-RAY SOURCE FOR GENERATING AN X-RAY BEAM HAVING SELECTABLE SECTIONAL SHAPES

Toshiaki Shimizu, Setagaya-ku, Tokyo, Japan, assignor to Nihona Denshi Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1971, Ser. No. 167,373
Claims priority, application Japan, July 30, 1970, 45/66867
Int. Cl. H01j *37/20*
U.S. Cl. 250—90 **4 Claims**

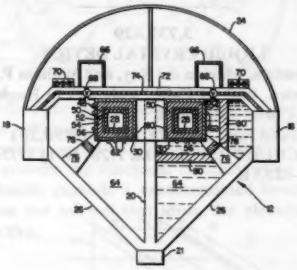


This specification discloses an X-ray source comprising an electron gun, an astigmator, a condenser lens and a target. The astigmator comprises four electrodes to which a voltage is supplied, said voltage determining the sectional shape of the electron beam passed through the astigmator. The electron beam passed through the astigmator is focused on the target by the condenser lens, the resultant impingement causing an X-ray to be generated from the target.

3,732,427
INTEGRATED TRANSPORT SYSTEM FOR NUCLEAR FUEL ASSEMBLIES

Arthur G. Trudeau, 17 Primrose St., Chevy Chase, Md., and Darrow F. Haagensen, P.O. Box 565, R.D. No. 3, Murraysville, Pa.

Filed March 17, 1971, Ser. No. 125,259
Int. Cl. G21f *5/00*
U.S. Cl. 250—108 R **35 Claims**

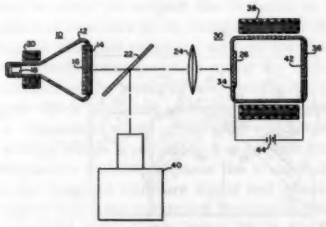


A transport system for conveying nuclear fuel assemblies from a nuclear power plant to a plant for reprocessing or to a burial ground comprising a unique two part shipping cask and a trailer transporter for the cask or casks, constructed on the single spar concept. The novel cask as well as the transporter are constructed with fast neutron as well as gamma ray attenuation materials thereby providing adequate shielding for the formidable array of radiation emitted by spent fuel assemblies used in recent advanced light water converter reactors as well as first generation fast breeder reactors. The trailer transporter may be interchangeably wheeled for transit over conventional roadways or railways, or a modified rail car may be provided onto which the entire cask and trailer transporter may be loaded. A plurality of such cars so loaded form a unit train, having a locomotive to haul the train and a control car immediately therebehind to monitor heat, radiation and stress parameters of each loaded car making up the unit train.

3,732,428
ELECTRO-OPTICAL IMAGE COMPOSITE DISPLAY

Murry J. Spangler, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 14, 1971, Ser. No. 106,329
Int. Cl. H01j *31/50*; G02b *27/14*
U.S. Cl. 250—213 VT **2 Claims**



Electro-optical display system for providing a composite display of an optical image wherein a first image provided by

means of a cathode ray display device is superpositioned onto a second image derived from hard copy information such as slides, maps or other character information. The system is comprised of a cathode ray tube with suitable means for directing a first light image generated by the cathode ray tube onto the photocathode of an image intensifier. The second image which may be projected by means of a slide projector is also focused onto the photocathode of the image intensifier. These two images directed onto the photocathode generate an electron image corresponding to the composite image of the first and second image. This electron image is then accelerated and amplified through the image intensifier to provide a visible light display by means of a suitable phosphor positioned at the opposite end of the image intensifier with respect to the photocathode. This output visible image is a composite image of the first two images.

3,732,429

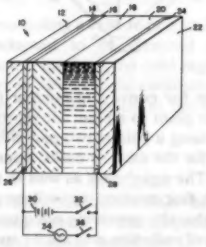
LIQUID CRYSTAL DEVICE

Morris Braunstein, Marina del Rey, and William P. Bleha, Jr., Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 12, 1971, Ser. No. 198,281

Int. Cl. G01t *1/16*; G02f *1/28*; H01j *31/50*

U.S. Cl. 250—213 R **18 Claims**



The liquid crystal device comprises a liquid crystal layer, a thin photoconductor layer, and a thin insulator layer sandwiched between the transparent supporting covers having a transparent electrically-conductive layer thereon. The photoconductor layer is cadmium sulphide (CdS) and the insulator layer is zinc sulphide (ZnS).

3,732,430

PHOTOELECTRIC SCANNING APPARATUS

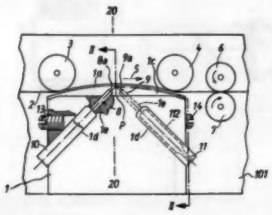
Friedrich Hujer, Grunwald, and Harald Fengler, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 29, 1971, Ser. No. 184,797

Claims priority, application Germany, Oct. 2, 1970, P 20 48 414.4

Int. Cl. G01n *21/30*

U.S. Cl. 250—219 FR **8 Claims**



A photoelectric scanning apparatus which detects one or more rows of information encoded in or on travelling webs or interconnected photographic films or prints has one or more pairs of mirror symmetrical light-conducting rods which are embedded in a support adjacent to the path of the web so that their axes intersect at a point of the path which is in line with the row of information to be scanned. The support is formed with two chambers each of which is located behind a different rod and each of which receives a removable clip. One of the clips contains one or more removable lamps and the other clip contains one or more removable photosensitive elements. A lamp in the properly inserted clip emits a light beam which passes through the respective rod and is normally reflected on the travelling web to thereupon pass through the other rod and to impinge on the photosensitive element behind the other rod. If the encoded information is in the form of notches or perforations, the reflection of light is interrupted whenever a notch or perforation register with the intersection of the axes of the rods whereby the photosensitive element generates a signal.

3,732,431

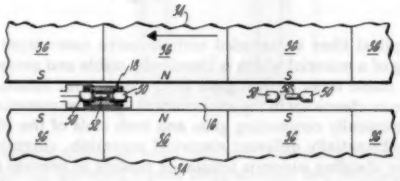
PULSE GENERATOR

Frank P. Knox, Bloomfield, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Sept. 27, 1971, Ser. No. 184,067

Int. Cl. G01p *3/48*

U.S. Cl. 307—106 **2 Claims**



A pulse generator having a rotor with a pair of axially spaced coaxial magnet rings and a switch mounted between the spaced magnet rings having a pair of spaced fixed contacts and a shuttle reciprocable between the fixed contacts and magnetically operated back and forth by the rotor for generating an electrical signal for each predetermined angular increment of displacement of the rotor.

3,732,432

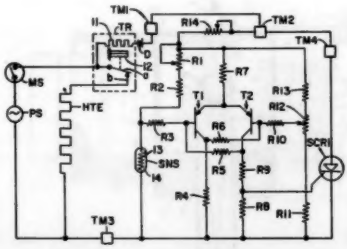
TEMPERATURE CONTROL SYSTEMS

Harold A. Brouneus, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 4, 1972, Ser. No. 250,162

Int. Cl. H01h *35/00*

U.S. Cl. 307—117 **8 Claims**



Temperature control systems or regulating circuits for use with electrical heating elements of burners of electric ranges, hot plates or cook-tops, such circuits and elements being directly energized from conventional or commercial sources

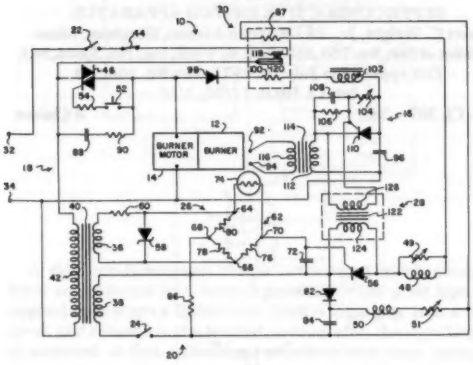
of power, such as 60 c.p.s. alternating current sources of 120 or 240 volts, and which systems provide high-temperature sensing and adequate temperature-limiting. An encapsulated high-temperature wire sensor is used in conjunction with thermal or electromagnetically actuated devices or relays, and solid state circuitry comprising a balanced amplifier-detector and at least one silicon controlled rectifier as a switch or switching device. The necessity for a step-down transformer is eliminated by the systems disclosed and an economic advantage is thereby attained. The control systems are especially suitable for use with electrically heated glass-ceramic cook-tops in order to provide higher temperatures and improved cooking performance when cooking vessels with non-flat bottoms are used with such cook-tops, while at the same time providing temperature-limiting of the burner system of the cook-tops for both electric heating-element protection and cook-top protection.

3,732,433

COMBUSTION CONTROL CIRCUIT FOR A FUEL BURNER

Ronald F. Lourigan, Kenosha, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Filed May 25, 1972, Ser. No. 256,981
Int. Cl. H01h *35/00*
U.S. Cl. 307—117 **26 Claims**



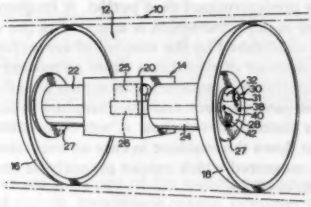
A combustion control circuit for an oil burner installation includes a triac for controlling the energization of both a burner motor and an ignition circuit. A control circuit carries out a safe start component check and then operates the triac when a thermostat closes and when no flame is detected at the burner. If ignition fails to take place in a trial-for-ignition period of predetermined time, a thermal switch is heated by a heater in the control circuit and opens to shut off the burner motor. However, if ignition takes place, flame is detected within the predetermined period by an improved, positively acting, reliable resistance bridge flame detector circuit. The flame detector circuit serves to render nonconductive a silicon controlled rectifier in the control circuit in order to disconnect the thermal switch heater while maintaining operation of the burner motor. Simultaneously, the ignition circuit is deenergized by a novel ignition disabling circuit connected between the silicon controlled rectifier and the ignition circuit. Failure of the triac in a short circuit condition prevents an unsafe condition due to connection of the thermal switch to the motor and due to the use of a second heater in circuit with the ignition circuit.

3,732,434

PIPELINE PIGS

Hartley A. French, Willowdale, Ontario, Canada, assignor to Trans-Canada Pipe Lines Limited, Toronto, Ontario, Canada

Filed March 2, 1972, Ser. No. 231,217
Int. Cl. H01h *35/18*
U.S. Cl. 307—118 **6 Claims**



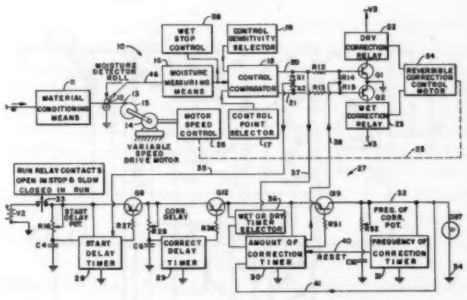
This invention provides a pipeline pig for transporting electrical circuitry through a pipeline. The pipeline pig includes a pressure-sensitive switch on the housing which is designed to electrically activate the electrical circuitry when the internal pipeline pressure exceeds a predetermined level. When the pressure does not exceed that level, the electrical circuitry remains inactive.

3,732,435

MOISTURE MEASURING AND CONTROL APPARATUS

Charles F. Strandberg, Jr., and Robert C. Strandberg, both of Greensboro, N.C., assignors to Strandberg Engineering Laboratories, Inc., Greensboro, N.C.

Filed March 27, 1972, Ser. No. 238,114
Int. Cl. F26b *13/12*
U.S. Cl. 307—118 **20 Claims**



An apparatus for measuring the moisture content of material being conveyed through a machine for conditioning the material to achieve a selected moisture content, and for controlling the speed at which the material is conveyed through the machine in order to subject the material to longer or shorter periods of exposure to the conditioner for the purpose of achieving the selected moisture content for the material. The apparatus includes: a moisture meter for measuring the moisture content of the material and producing an electric voltage signal which is related to the moisture content of the material, a reference signal generator which produces a reference voltage which is related to a selected moisture standard, a comparator which compares the measured moisture signal with the standard moisture signal and generates a dry condition signal when the measured moisture content is less than the standard moisture content by a predetermined amount and generates a wet condition signal when the measured moisture content exceeds the standard moisture content by a predetermined amount. Controls are provided which respond to the dry and wet condition signals in order to in-

crease the speed or decrease the speed at which the material is conveyed through the machine. Timers are provided by which the dry and wet condition signals are prevented from actuating the speed controls except after a start time delay sufficient to permit the material in the machine when the machine is started to clear the machine, and a correction time delay which insures that a condition requiring correction persists long enough to warrant correction. An amount of correction timer is actuated after the time delays which unblocks the controls and permits them to respond to the dry and wet condition signals for a predetermined time period. A frequency of correction timer is provided which is actuated at the end of the time period established by the amount of correction timer to recycle the amount of correction timer at reoccurring intervals of predetermined frequency. The timers are all connected to a common power source and are energized in sequence by plural series connected switches. A wet stop control is provided to shut down the machine in case an excessive moisture condition is measured which cannot properly be corrected by the automatic controls.

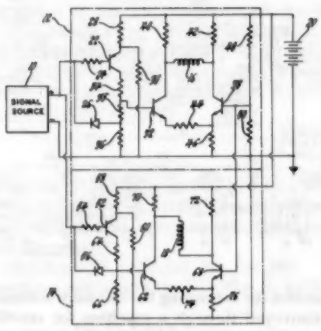
ERRATUM

For Class 307—149 see:
Patent No. 3,732,468

3,732,436
APPARATUS FOR SUPPLYING CURRENT THROUGH A LOAD APPROXIMATING A SINGLE CYCLE OF A SINE WAVE IN RESPONSE TO AN INCREASING SIGNAL VOLTAGE

Robert B. Gelenius, Davison, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 34,981, May 6, 1970, Pat. No. 3,636,447.
This application Nov. 5, 1971, Ser. No. 196,015
Int. Cl. G06g 7/12
U.S. Cl. 307—229 **2 Claims**

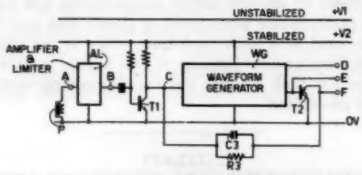


A wide angle electrical gauge having two coils whose magnetic axes are at right angles. A signal source supplies a signal whose magnitude is proportional to the magnitude of the condition to be indicated. A sine generator is responsive to the output of the signal source and controls the current through one of the coils in a manner such that the magnetic field along its magnetic axis varies in an approximated sinusoidal fashion. A cosine generator is responsive to the output of the signal source and controls the current through the remaining coil in a manner so as to generate a magnetic field along its magnetic axis which is phase shifted from the magnetic field generated by the sine generator so as to take the form of an approximated cosine waveform in relationship thereto. A magnetic armature aligns itself with the resultant of the two magnetic fields whose angular position corresponds to the magnitude of the condition being measured.

3,732,437
CONTROL CIRCUITRY FOR ANTI-LOCK BRAKE SYSTEM

Denis Sharp, Sussex, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed March 15, 1971, Ser. No. 124,218
Claims priority, application Great Britain, March 18, 1970, 13,147/70
Int. Cl. H03d 13/00
U.S. Cl. 307—233 **14 Claims**

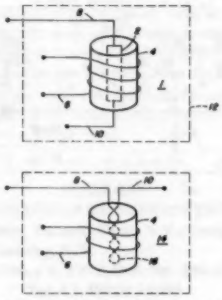


A control circuitry for anti-lock brake systems for wheeled vehicles. The control circuit comprises means for producing a waveform whose frequency is the same as that of an AC signal produced in response to wheel rotation, said waveform has a peak value which is a function of the instantaneous frequency of the AC signal. The control circuit can detect a predetermined rate of change of the wheel.

3,732,438
SUPERCONDUCTIVE SWITCH APPARATUS

Robert C. Wright, Jr., 18 Lafayette Avenue, Hingham, Mass.

Division of Ser. No. 750,568, Aug. 6, 1968, Pat. No. 3,646,363.
This application July 26, 1971, Ser. No. 166,311
Int. Cl. H03k 17/00, 3/38
U.S. Cl. 307—245 **8 Claims**



Apparatus is provided whereby the conductive state of means including an element capable of exhibiting the superconductivity is controlled by the maintenance of said means in intimate thermal communication with a paramagnetic salt. The temperature of such means thereby being discretely and selectively changed by the control of the magnetic state of said paramagnetic salt.

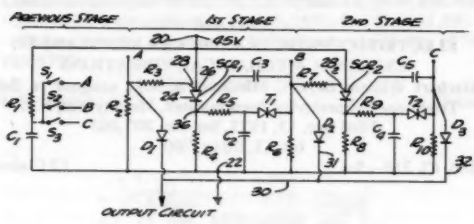
3,732,439
PULSE PRODUCING CIRCUIT PARTICULARLY ADAPTED FOR BUTTON TYPE TELEPHONES

Noel M. Calvin, 2683 Buena Vista Way, Berkeley, Calif.

Filed Nov. 28, 1969, Ser. No. 880,592
Int. Cl. H04k 23/30
U.S. Cl. 307—284 **1 Claim**

The invention is a chain counter circuit for producing output pulses adaptable for actuating a relay. The chain counter is particularly adapted to use with a button type telephone for

supplying numbers of pulses corresponding to digits required to the telephone line. The chain counter comprises 10 stages, each of which is similar to a mono-stable multi-vibrator. Each stage when activated by an incoming signal produces, after a

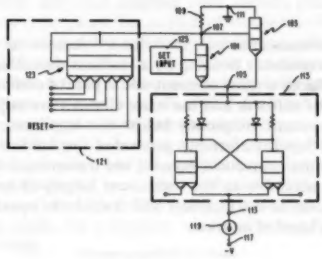


predetermined time delay, a pulse in the output circuit and a triggering pulse for activating the next stage in sequence. The stage then deactivates itself. The number of output pulses depends upon which stage is initially actuated.

3,732,440
ADDRESS DECODER LATCH

Steven Platt, Underhill, Vt., and Jehoshua N. Pomeranz, Suffern, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,619
Int. Cl. H03k *3/286, 3/295*; **G11c** *11/40*
U.S. Cl. 307—289 **4 Claims**



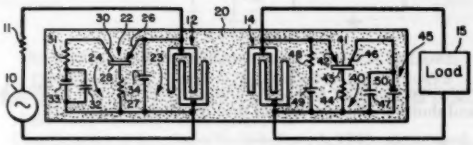
A dual condition latch circuit is disclosed which changes from an unlatched to a latched condition when a set input is applied only when a signal input from a logic gate is at a first level, and remains in the latched position after the signal input is removed. A first and second transistor with their emitters commonly connected to a current source and the collector of the first transistor connected to the base of the second transistor with a resistor connected between the collector of the first transistor and a reference point and the collector of the second transistor connected directly to the reference point constitutes the basic latching circuit. A set input pulse is applied to the base of the first transistor and a signal input level from a logic device is applied to the base of the second transistor such that only when the signal input is at a first level does the second transistor switch "on" when the set input pulses the first transistor from a conducting to a nonconducting state. If the signal input is not at a first level when the set input pulses the first transistor, the second transistor does not switch "on" and the circuit remains in an unlatched condition.

3,732,441
SURFACE WAVE INTEGRATABLE FILTER FOR COUPLING A SIGNAL SOURCE TO A LOAD

Fleming Dias, Palo Alto, Calif., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 7, 1971, Ser. No. 141,322
Int. Cl. H03h *7/44*
U.S. Cl. 307—295 **1 Claim**

A surface-wave integratable filter includes spaced input and output transducers on a surface of a piezoelectric substrate. The input transducer responds to signals from a source for launching acoustic surface waves in the substrate. The output transducer responds to the acoustic surface waves to develop an electrical signal for application to a load. Each transducer presents a predetermined clamped capacitance and a pair of transistors are included in the filter to compensate that capacitance. Each transistor has input and output signal cir-

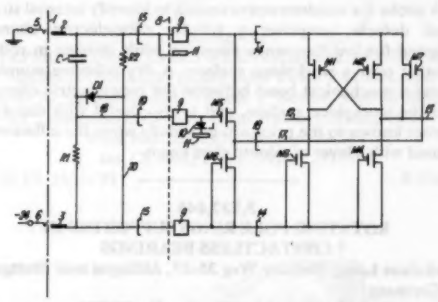


cuits with an assigned one of the transducers coupled into its input signal circuit. Impedance means, common to the input and output signal circuits of each transistor, controls its operation to present, in parallel with its assigned transducer, an inductive reactance which at the frequency of the signals is substantially equal to the reactance of the clamped capacitance of its associated transducer.

3,732,442
ELECTRICAL TIMING DEVICE

Keith Ronald Frederick Husbands, Sandiacre, and John Dawson, Kirby-in-Ashfield, both of England, assignors to Plessey Handel Und Investments A.G.

Filed June 22, 1971, Ser. No. 155,545
Claims priority, application Great Britain, July 14, 1970, 34,159/70
Int. Cl. H03k *5/153*
U.S. Cl. 307—304 **3 Claims**



An electrical timing device comprising a capacitor, a timing resistor and a discharge circuit for the capacitor which is maintained ineffective as long as power supply is not interrupted. In a preferred application, the interval timed exceeds the change-over time of a bistable register, a priming signal applied to bias the register into a preferred state being terminated on the expiry of the interval.

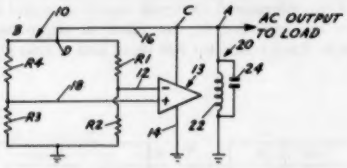
3,732,443
ON-OFF DETECTION DEVICE

Rodger T. Lovrenich, Temperance, Mich., assignor to Renko Associates, Grosse Pointe, Mich.

Filed May 12, 1971, Ser. No. 142,596
Int. Cl. H03k *17/00*
U.S. Cl. 307—308 **10 Claims**

The invention relates to an on - off detecting device embodying a Wheatstone Bridge, wherein one leg of the bridge accommodates a resistance effect element which changes re-

sistance value upon sensing a phenomenon, the change of resistance driving a differential input, high gain, common mode

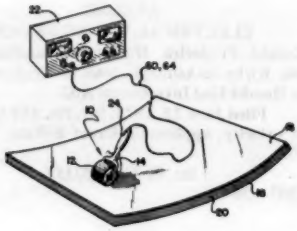


rejection amplifier into oscillation through positive feedback, and shutting off the amplifier through negative feedback.

3,732,444
TUBULAR TRANSDUCER AND DRY COUPLANT THEREFOR

Darrow L. Miller, Los Angeles, Calif., assignor to North American Rockwell Corporation, El Segunda, Calif.

Division of Ser. No. 832,568, June 12, 1969, Pat. No. 3,678,737. This application April 30, 1971, Ser. No. 139,091
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 **2 Claims**

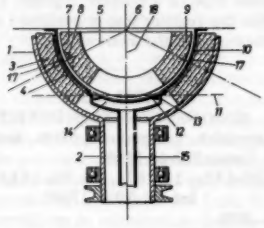


A probe for nondestructive testing to identify internal structural defects comprises a tubular piezoelectric element adapted for low frequency vibration while moving in rolling contact over a workpiece surface. A dry adhesive couplant forms a mechanical bond between the piezoelectric element and the workpiece surface, and is also useful with disc-type probes known to the prior art, especially when the adhesive is coated with a layer of minute glass beads.

3,732,445
ROTATING POLE RINGS SUPPORTED IN CONTACTLESS BEARINGS

Nickolaus Laing, Hofener Weg 35-37, Aldingen near Stuttgart, Germany

Filed Dec. 14, 1970, Ser. No. 97,771
Claims priority, application Austria, Dec. 16, 1969, 11681
Int. Cl. H02k 5/16
U.S. Cl. 310—90 **17 Claims**

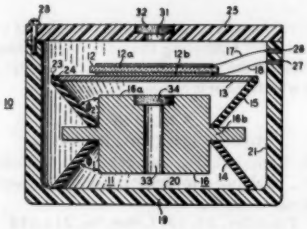


A rotating magnetic machine having two pole rings defining a common air gap, said air gap being arranged on the surface of a rotational body and at the same time defining the bearing gap for supporting the rotor of the machine and having a flowable material in the bearing gap for producing a hydrodynamic bearing film.

3,732,446
ELECTROACOUSTIC TRANSDUCER RESISTANT TO EXTERNAL MECHANICAL VIBRATIONS

Herbert William Bryant, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1971, Ser. No. 207,003
Int. Cl. H01v 7/00
U.S. Cl. 310—9.4 **12 Claims**

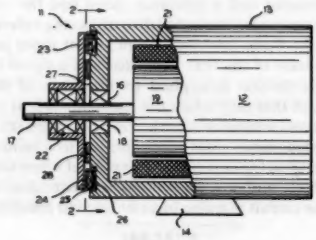


An electromechanical transducer element is supported within a transducer housing by a resilient mounting assembly which includes a mass element and a pair of conical washers. The washer stiffness and the mass element are adjusted for a natural resonant frequency below the transducer operating frequency band. Externally generated mechanical vibrations applied to the transducer housing are transmitted through the mounting assembly to the transducer largely at low frequencies, and thus do not interfere with transducer operation in the frequency band of interest.

3,732,447
CLUTCH AND BRAKE MOTOR ARRANGEMENT

Frank J. Perhats, 1280 Burr Oak Lane, Barrington, Ill.

Filed Dec. 13, 1971, Ser. No. 207,002
Int. Cl. H02k 7/10
U.S. Cl. 310—76 **15 Claims**



A motor brake arrangement comprising an electric motor having a brake disc attached to its shaft directly, or through a one-way clutch. The brake disc is pulled against brake pads to either stop the motor rotor quickly or to keep it from turning in one direction when the motor is not operated. Permanent magnetic means are used to assure sufficient frictional contact on the brake pads to stop or hold the motor shaft.

3,732,448

SYNCHRONOUS ELECTRIC MOTOR

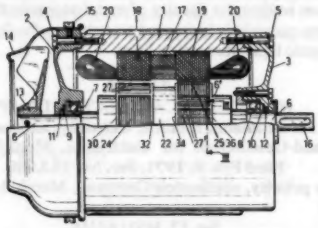
Lodewijk Schiethart, Dubbeldam, Netherlands, assignor to N.V. Electromotorenfabriek Dordt, Dordrecht, Netherlands

Continuation-in-part of Ser. No. 2,195, Jan. 12, 1970, Pat. No. 3,614,496. This application April 6, 1971, Ser. No. 131,596

Claims priority, application Netherlands, April 22, 1970, 70/05797

Int. Cl. H02k *12/00*

U.S. Cl. 310—162 4 Claims



A polyphase synchronous A C motor having rectangular wave power input includes a stator having axially spaced core members, a D. C. winding between the core members and a polyphase winding extending through the core members. The rotor has two squirrel cage sections, one aligned within each core member and each squirrel cage section carries a pole piece. Each pole piece has a pair of diametrically opposed radially projecting poles and the poles of one pole piece are displaced 90° with respect to the poles of the other pole piece. The motor has a total of four circumferentially spaced poles and thus presents a pole pitch of 90° for each phase. The polyphase winding has at least one winding per phase. In one embodiment the poles have a circumferential width (90°) equal to the pole pitch and the polyphase windings have a like circumferential width. In another embodiment the poles have a circumferential width (60°) which is two-thirds of the pole pitch and, again, the polyphase windings have a like circumferential width.

3,732,449

ROTATIONAL ANGLE DETECTING DEVICE

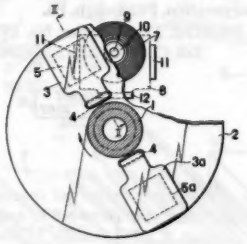
Masaaki Oishi, Tokyo; Yoshinaga Takahashi, Yachiyo, and Kelichi Yoshizawa, Matsudo, all of Japan, assignors to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed July 8, 1971, Ser. No. 160,756

Claims priority, application Japan, July 9, 1970, 45/59473

Int. Cl. H02k *1/12*

U.S. Cl. 310—259 6 Claims



A rotational angle detecting device comprising a rotor having a rotary disk carrying two L-shaped yokes and associated permanent magnets, disposed symmetrically relative to the axis of rotation thereof. A stator of the device has a stationary coil and a stationary yoke. The rotational yokes and magnets revolve past the stationary coil and stationary yoke. As the individual magnets move past the stationary coil, a closed magnetic path is formed through confronting faces of the movable and stationary yokes. As the magnets move past the stationary coil, the stationary coil cuts the magnetic flux instantaneously to produce a high induced voltage across the coil. The rotor is driven in timed relationship with a rotationally driven or rotary body so that the maximum induced voltage can be used in indicating an angular position of the rotary body with respect to a reference position.

3,732,450

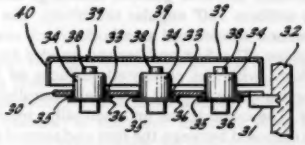
ELECTRON GUN ASSEMBLY HAVING CATHODES INSULATIVELY MOUNTED IN METALLIC PLATE

Harvey F. Mayers, Huntingdon Valley, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Continuation of Ser. No. 873,361, Nov. 3, 1969, abandoned. This application Aug. 20, 1971, Ser. No. 173,697

Int. Cl. H01j *29/04, 29/50*

U.S. Cl. 313—70 R 1 Claim



For the multi-gun assembly of a cathode ray tube, a unitary cathode mounting plate provided with integral beading spaced, and having three apertures — in either delta or in-line configuration — within which cathode eyelets are glass-frit mounted. Conventional cathode and cathode heater structure is associated with each of the eyelets insulatively secured to the plate by the glass frit.

3,732,451

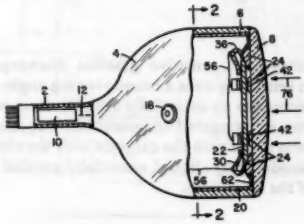
STEPPED SUPPORTS BETWEEN GLASS PLATE DISPLAY SCREEN AND CATHODE RAY TUBE FACEPLATE

David R. Steinberg, and William T. Sutton, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 16, 1970, Ser. No. 89,716

Int. Cl. H01j *29/12, 29/02, 29/18*

U.S. Cl. 313—91 8 Claims



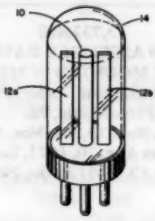
A planar member such as a phosphor coated fiber optic plate, having a thermal coefficient of expansion that is incompatible with that of a cathode ray tube envelope and faceplate, is accurately supported a precise distance from the inner surface of the faceplate by a plurality of step-shaped supports having a spacer portion disposed between the planar member and faceplate and a shoulder portion adjacent to the periphery of the planar member. Conductive spring clip means affixed to the supports apply a retaining force to the planar member and make electrical contact thereto.

3,732,452

ULTRAVIOLET RADIATION DETECTOR WITH 360° ANGULAR SENSITIVITY

Roger E. Axmark, Fridley, and Clifford W. Erickson, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1971, Ser. No. 201,662
Int. Cl. H01j 39/04
U.S. Cl. 313—98 11 Claims



An ultraviolet sensitive gaseous discharge detector has an essentially uniform 360° angular sensitivity. The detector has first and second anodes and a cathode which are aligned in a common plane. The first and second anodes have elongated cross-sections, with the elongated surfaces of the first and second anodes being aligned essentially parallel to the common plane. The cathode has an essentially circular cross-section and is disposed between the first and second anodes.

3,732,453

WIDE ANGLE ULTRAVIOLET RADIATION DETECTOR

Robert G. Johnson, Minnetonka, and Benjamin T. McClure, Hopkins, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1971, Ser. No. 201,672
Int. Cl. H01j 39/04
U.S. Cl. 313—100 10 Claims

An ultraviolet sensitive gaseous discharge detector has uniform sensitivity over a broad viewing angle. The cathode of the detector has an essentially circular cross-section while the anode has an elongated cross-section. The anode is aligned in a common plane with the cathode with the elongated surfaces of the anode being aligned essentially parallel to the common plane of the electrodes.

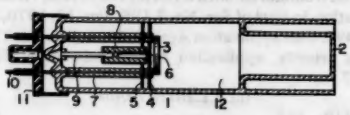
3,732,454

GLOW DISCHARGE TUBE FOR ATOMIC LIGHT-ABSORPTION ANALYSIS

Hirosi Okagaki; Yoji Arai, both of Katsuta-shi; Sadami Tomita, and Akira Hosoya, both of Hitachi-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1971, Ser. No. 201,663
Int. Cl. H01j 61/04
U.S. Cl. 313—209 12 Claims

A glow discharge tube for atomic light-absorption analysis in which a hollow cathode for producing atomic light-absorption lines comprises a molded article of fine powder containing at least one metal element which produces the atomic light-absorption lines, the article being molded without heating it whereby the dislocation of atomic distance remains in



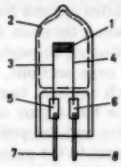
the crystalline lattice to improve the sputtering rate of the metal atom so that the density of metal atoms in the hollow of the hollow cathode is increased to enhance the light intensity of the atomic light-absorption lines.

3,732,455

HALOGEN INCANDESCENT LAMP

Gerhard M. Neumann, Munich, Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische, Munich, Germany

Filed Feb. 9, 1971, Ser. No. 113,980
Claims priority, application Germany, March 3, 1970, P 20 09 916.5
Int. Cl. H01j 61/16
U.S. Cl. 313—222 9 Claims



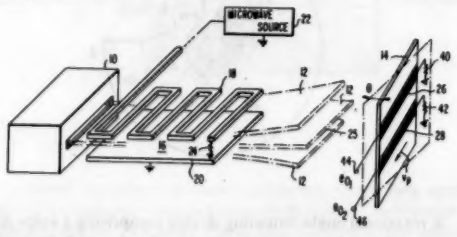
The halogen incandescent lamp has a tungsten filament and its halogen cycle takes place with fluorine participating therein. To prevent corrosive action of the fluorine on internal lamp components, the inert fill gas contains an additive of perhalogenated low molecular weight hydrocarbons with at least one fluorine atom per molecule in a concentration of from 1×10^{-6} to 1×10^{-6} gram atoms of fluorine, and from 1×10^{-6} to 1×10^{-6} gram atoms of at least one more halogen such as chlorine, bromine, or iodine per cc of bulb volume; preferably, difluorodibromomethane (CF_2Br_2) is admixed to the fill gas. During lamp operation, a cyclic tungsten-fluorine process takes place close to the filament, the tungsten not included in this cycle is transported back to the filament by the second halogen.

3,732,456

WIDEBAND DEFLECTION MODULATED SEMICONDUCTOR AMPLIFIER

Daniel C. Buck, Hanover, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 27, 1971, Ser. No. 192,811
Int. Cl. H01j 23/16, 29/96
U.S. Cl. 315—3 12 Claims



Wideband performance is obtained in a deflection modulated microwave traveling wave electron beam semiconductor

amplifier by tilting the travelling wave collection circuit with respect to the electron beam axis such that the phase velocity of the collection circuit matches the longitudinal component of the electron beam velocity. Trimming of the longitudinal component to obtain this match is obtained by varying the beam voltage.

3,732,457

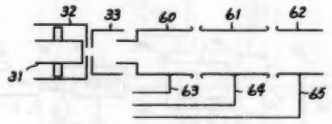
ELECTRODE LENS POTENTIAL ARRANGEMENT FOR A POST-ACCELERATION PICTURE TUBE

Ichiro Ueno, and Kazuo Toya, both of Tokyo, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 27, 1971, Ser. No. 110,059

Claims priority, application Japan, Jan. 30, 1970, 45/8217

U.S. Cl. 315—15 **5 Claims**



An electron gun for a post-acceleration picture tube comprises a first electrode to which a low voltage is applied, a second electrode to which a high voltage is applied and a third electrode to which an intermediate voltage is applied. The main lens of the electron gun is composed of the first, second and third electrodes. The electron gun is particularly useful in a post-acceleration shadow-mask type color picture tube.

3,732,458

CIRCUIT ARRANGEMENT FOR CORRECTING THE DEFLECTION OF AT LEAST ONE ELECTRON BEAM IN A TELEVISION PICTURE TUBE BY MEANS OF A TRANSDUCTOR

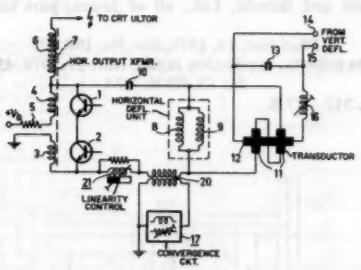
Jorg Wolber, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,524

Claims priority, application Germany, Aug. 7, 1969, P 19 40 216.5

Int. Cl. H01j *29/76*

U.S. Cl. 315—24 **6 Claims**



A circuit arrangement for raster correction in a television picture tube by means of a transductor whose power winding is connected in parallel with at least a portion of the line deflection coils, the line deflection generator having a low internal impedance. In order to increase this impedance a mainly inductive impedance is connected in series with the generator. In a picture tube employing at least two electron beams the series impedance may include the convergence circuit. As a result the convergence in the corners of the picture screen is also improved. The linearity control circuit may likewise form part of the series impedance.

3,732,459

MAGNETRONS

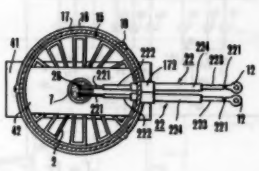
Tomokatus Oguro, Mobara; Mitsuru Watanabe; Hideo Takatsuki, Hitachi; Kunihiko Okamoto, Gakasuzumachi, and Teruo Suda, Matsudo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 20, 1971, Ser. No. 145,320

Claims priority, application Japan, May 20, 1970, 45/42462

Int. Cl. H01j *25/50*

U.S. Cl. 315—39.51 **4 Claims**



In a magnetron having lead wires for passing heating current to the cathode filament, each of the lead wires comprises a coaxial cable including a core conductor for passing the filament heating current, at least one insulator layer having a large microwave loss surrounding the core conductor, and an outer conductor surrounding the insulator layer.

3,732,460

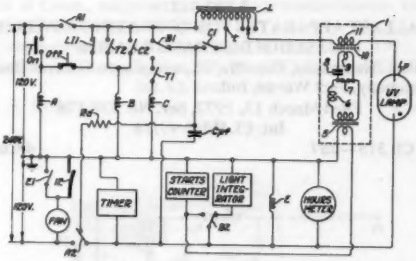
CIRCUIT FOR INSTANT RESTART OF HIGH PRESSURE DISCHARGE LAMP

Hans L. Wattenbach, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 28, 1972, Ser. No. 221,662

Int. Cl. H05b *41/04*

U.S. Cl. 315—123 **4 Claims**

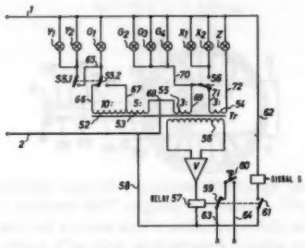


In the running condition, a high pressure lamp is connected in series with an inductive reactor across the line (240 volts), and a power factor correcting capacitor is connected across the line. To assure instant starting whether the lamp is hot or cold, an igniter is energized which injects kilovolt radio frequency pulses in series with the reactor open circuit voltage across the lamp, and the reactor open circuit voltage is boosted a predetermined factor up to 3 × line voltage by temporarily connecting the power factor correcting capacitor to a tap in the inductive reactor.

3,732,461
UNBALANCE DETECTION CIRCUITS FOR PLURAL PARALLEL LAMP SYSTEMS

Horst Bickl, Munich; Joachim Lange, Unterhaching; Heinrich Neumann, Munich; Bernhard Goschin, Munich, and Alois Rieder, Munich, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Munich, Germany

Filed Oct. 16, 1970, Ser. No. 81,267
Claims priority, application Germany, Nov. 25, 1969, P 19 59 016.0
Int. Cl. H01j 1/60; H05b 37/03
U.S. Cl. 315—130 2 Claims



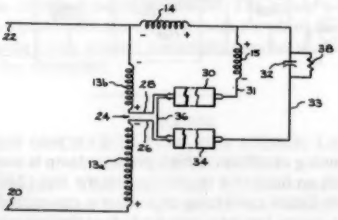
An illumination installation, in particular for lighting a transparent table or support in step-by-step microfilm camera apparatus, such installation providing for the even illumination of a condenser of an image projecting apparatus. A plurality of lamps are distributed over the surface to be illuminated, the lamps being divided into at least two groups. In certain embodiments the current supply circuit for feeding the lamps is divided into two parallel circuits, each of which contains a resistor, there being an amplifier which scans the voltage drop at the resistors and operates an optical and/or acoustical signal transmitter upon an unbalance of the voltage drops through the respective resistors.

In another embodiment, the feeding of current to the lamps is divided into at least two parallel circuits, the passage of current through which is compared by a compensatory current transformer which controls a relay controlling an optical and/or acoustic signal transmitter and/or a switch controlling a further apparatus controlling circuit.

3,732,462
BALLAST APPARATUS FOR OPERATING A PAIR OF GASEOUS DISCHARGE LAMPS

Frank A. Neusbaum, Danville, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed March 13, 1972, Ser. No. 234,176
Int. Cl. H05b 41/16
U.S. Cl. 315—257 4 Claims

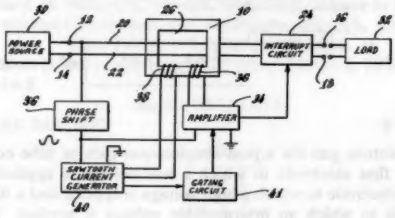


A ballast apparatus for sequentially igniting and operating two gaseous discharge lamps includes a transformer having a primary winding with a tap dividing it into two primary winding portions. A first secondary winding is connected to the end of one primary winding portion remote from the tap. A second secondary winding is connected to the first secondary winding and a first lamp can be connected between the second secondary winding and the primary winding tap. A capacitive reactance is connected to the first secondary winding and a second lamp can be connected between the capacitive reactance and the primary winding tap.

3,732,463
GROUND FAULT DETECTION AND INTERRUPTION APPARATUS

Brian Dale, Lynnfield, Mass., assignor to GTE Laboratories Incorporated, Bayside, N.Y.

Filed Jan. 3, 1972, Ser. No. 215,020
Int. Cl. H02h 3/26
U.S. Cl. 317—18 D 6 Claims

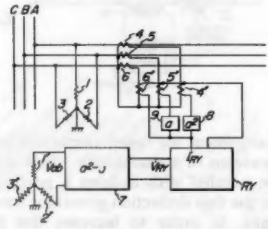


An apparatus for detecting a ground fault and for interrupting the supply of electrical energy upon detection of a fault is disclosed comprising a means for establishing a magnetic flux, ϕ_d, which is representative of the difference in current flowing between two conductors, a means for establishing a reference magnetic flux, ϕ_r, and means for sensing when ϕ_d exceeds ϕ_r and for interrupting the application of electrical energy to a utility device when ϕ_d exceeds ϕ_r.

3,732,464
DISTANCE RELAY SYSTEM

Yoshiteru Miki; Hiroshi Sasaki, both of Hitachi; Masami Okamura, Musashino, and Yoshifumi Oura, Yokohama, all of Japan, assignors to The Tokyo Electric Power Co., Chuyoda-ku; Tokyo Slubauria Electric Co., Ltd., Kawasaki-shi and Hitachi, Ltd., all of Japan, part interest to each

Filed Nov. 15, 1971, Ser. No. 198,787
Claims priority, application Japan, Nov. 19, 1970, 45/102362
Int. Cl. H02h 3/28
U.S. Cl. 317—27 R 7 Claims



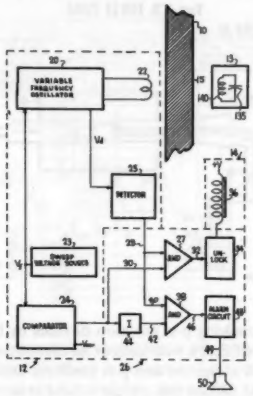
A back up protective relay system using a distance relay for protecting transmission lines from faults occurring thereon which system responds only to unsymmetrical faults that give rise to negative-sequence current, is provided. As the polarity voltage is used a voltage relevant to the faulted phase.

3,732,465

ELECTRONIC SENSING AND ACTUATOR SYSTEM

Ronald S. Palmer, San Jose, Calif., assignor to Charles A. Walton, Los Gatos, Calif.

Filed Sept. 20, 1971, Ser. No. 181,865
Int. Cl. E05b *49/00*
U.S. Cl. 317—134 14 Claims



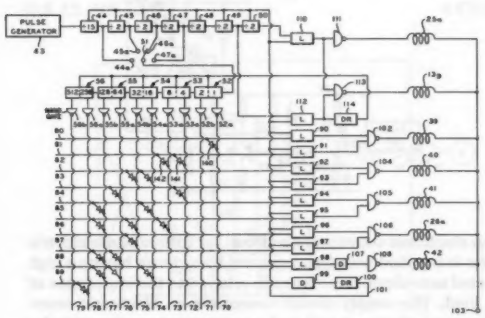
An electronic sensing and actuator control system for sensing an energy change dependant on the proximity of a coded member to a sensor mechanism, the mechanism including an electric field producing means operative over a range of continuously varying frequencies; the coded member including a passive energy absorbing circuit responsive to a predetermined frequency range and adapted for placement in proximity to said mechanism to create a variation in the energy level of said electric field producing means; detecting means for detecting variations in the energy level of said electric field; and control-actuator means adapted to respond to the detecting means.

3,732,466

PROGRAMMER

Daniel M. Vesper, and Vern A. Street, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed April 1, 1971, Ser. No. 130,250
Int. Cl. G01n *31/08*; H01h *47/14*
U.S. Cl. 317—140 7 Claims



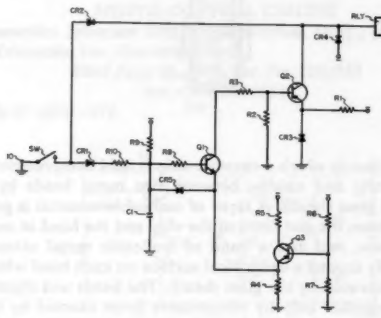
A programmer is disclosed which utilizes a diode matrix. Pulses at a predetermined frequency are applied to the input of a counter which has a plurality of outputs. These outputs are applied to first terminals of the matrix so that signals are established representing consecutive time intervals. The matrix is provided with a plurality of outputs which are applied through latching circuits to provide control signals. The input and output terminals of the matrix are selectively connected together by means of diodes so that output signals are established in any desired time sequence. This programmer can be employed to advantage to control a chromatographic analyzer.

3,732,467

RELAY RELEASE DELAY CIRCUIT

Jeffrey P. Mills, Forest Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, North Lake, Ill.

Filed May 3, 1971, Ser. No. 139,336
Int. Cl. H01h *47/18*
U.S. Cl. 317—141 S 1 Claim



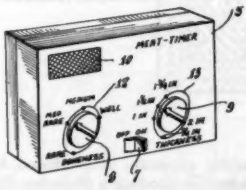
A circuit is disclosed that is connected to the driving conductor of a relay to increase the relay's release time. The circuit includes an RC timing circuit that is effective to maintain an amplifier circuit in a non-conductive state. The application of an operating potential to the driving conductor discharges the capacitor which switches the amplifier to the conductive state to maintain the relay operated for a period of time determined by the RC constants of the circuit. The circuit has a variable level limit for the capacitor charge to maintain the time interval constant in spite of voltage source variations.

3,732,468

TIMING DEVICE FOR COOKING MEAT

Allan E. Witt, Westport, and George M. Suhm, Bridgeport, both of Conn., assignors to Food Automation-Service Techniques, Inc., Bridgeport, Conn.

Continuation-in-part of Ser. No. 111,426, Feb. 1, 1971, abandoned. This application Feb. 16, 1972, Ser. No. 226,741
Int. Cl. G07c *1/02*
U.S. Cl. 307—149 7 Claims

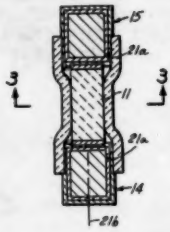


An alarm type timing device is provided for use in cooking meat. The device includes a non-linear, electronic circuit adapted to approximate the unusual nature of outdoor charcoal-grill type of cookery. The circuit is so designed as to act as a mathematical model for the meat being cooked and, using empirical data, takes into consideration the nature of the bed of charcoal, the desired "doneness", and the thickness of the meat, and thereby provides an alarm signal when the cooking is completed.

3,732,469
CAPACITOR WITH CERAMIC CHIP HELD IN COMPRESSION BOTH LATERALLY AND AXIALLY BY A GLASS SLEEVE

Alvin N. Watson, Glendora, Calif., assignor to Monolithic Dielectrics, Inc., Burbank, Calif.

Filed May 30, 1972, Ser. No. 257,921
Int. Cl. H01g 1/02
U.S. Cl. 317—261 9 Claims

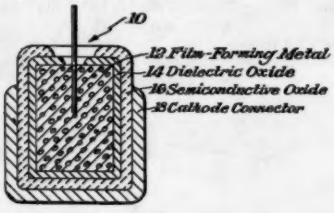


A capacitor in which a ceramic chip is held compressively, both laterally and axially, between two metal heads by a peripheral glass sheath. A layer of malleable material is provided between the end faces of the chip and the head at each of the heads, and also a band of malleable metal extends peripherally around a cylindrical surface on each head which band is embraced by the glass sheath. The heads and sheaths are held together only by compressive force exerted by the sheath, the malleable metal providing a compressive joinder between the abutting faces resistive to thermal and mechanical shock. The metal also provides, between the sheath and heads, for relief of excessive forces due to variations and tolerances of the parts and for a reliable hermetic seal. The chip is laterally gripped by the glass sheath to hold it against shifting or tipping in the sheath, and the invention includes a method for shrinking the glass sheath onto the chip.

3,732,470
ELECTROLYTIC DEVICE AND SEMICONDUCTOR OXIDE ELECTROLYTE THEREFORE

Preston Robinson, Bulkley St., Williamstown, Mass.

Continuation-in-part of Ser. No. 767,516, Oct. 14, 1968, Pat. No. 3,631,302. This application Dec. 20, 1971, Ser. No. 210,083
Int. Cl. H01g 9/04
U.S. Cl. 317—230 4 Claims

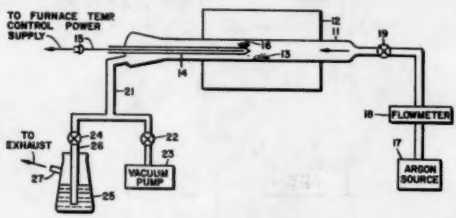


A solid electrolytic capacitor is produced by competing electrolytic reactions that produce a dielectric film on the surfaces of a porous anode and a layer of semiconductive oxides on the dielectric film. Current is passed through the anode and a suitable cathode in an aqueous electrolyte containing a film-forming anion and cation capable of being oxidized to a semiconductive layer on the surface of the dielectric film. The thickness of the semiconductive layer is controlled by an intermediate step of depositing a given amount of a hydroxide of the cation on the dielectric film by reversing the current between the initial and final oxidation.

3,732,471
METHOD OF OBTAINING TYPE CONVERSION IN ZINC TELLURIDE AND RESULTANT P-N JUNCTION DEVICES

Shou-Ling Hou, Lexington, Mass.; James A. Marley, Jr., Saratoga, Calif.; Kenneth G. Beck, deceased, late of Billerica, Mass., and by Marilyn Beck, heir, Union, N.J., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,068
Int. Cl. H01l 7/02
U.S. Cl. 317—234 R 9 Claims

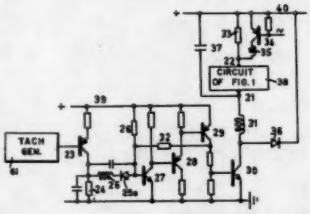


A method of making p-n junction devices by bombarding a polished crystal of ZnTe with ions of an element selected from the Group VII A elements and p-n junction devices resulting from this method. When the crystal is held at an elevated temperature during the ion bombardment step, subsequent annealing is usually not necessary. When the crystal temperature is at room temperature or below during the ion bombardment step, type conversion can be obtained only by post implantation annealing. The particular type of p-n junction device and the characteristics thereof are determined by the particular schedule of annealing to which the implanted body is subjected.

3,732,472
CURRENT SUPPLY AND COMMUTATION CIRCUIT OF ELECTRIC MOTOR

Robert Favre, Lausanne, Switzerland, assignor to Golay Buchel & Cie S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 676,871, Oct. 20, 1967, abandoned. This application June 15, 1970, Ser. No. 46,438
Claims priority, application Switzerland, Oct. 26, 1966, 15601/66
Int. Cl. H02k 37/00
U.S. Cl. 318—138 12 Claims

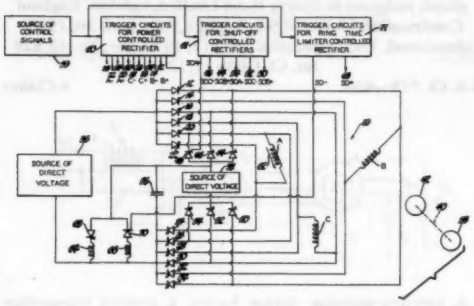


An electronic commutation circuit for a three phase electric motor is supplied with direct current by a circuit having a high internal non-ohmic impedance in relation to the impedance of the load. The supply circuit comprises an electronic interrupter, an inductance coil and a resistance in series with the motor commutation circuit. The supply circuit is opened when the current reaches a selected upper limit value and is closed when the current reaches a lower limit value thereby maintaining the current substantially constant. The limits may be made responsive to a motor function, for example speed or load. The switching of the commutating circuit is effected by transistors or thyristors under control of a cyclical impulse generator and distributor.

3,732,473
INVERTER COMMUTING CAPACITOR CHARGE CONTROL CIRCUIT

Richard W. Johnston, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1971, Ser. No. 175,136
Int. Cl. H02m
U.S. Cl. 318—227 **2 Claims**

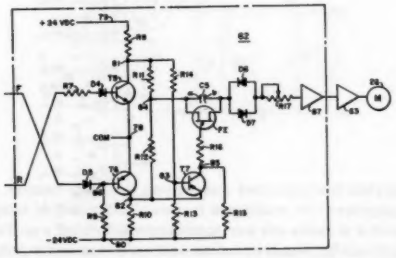

SOURCE OF CONTROL SIGNALS
TRIGGER CIRCUITS FOR POWER CONTROLLED RECTIFIER
TRIGGER CIRCUITS FOR SHUT-OFF CONTROLLED RECTIFIERS
TRIGGER CIRCUITS FOR RING TIME LIMITER CONTROLLED RECTIFIER
SOURCE OF DIRECT VOLTAGE
SOURCE OF DIRECT VOLTAGE

An inverter commuting capacitor is connected in shunt with a series combination of an inductor and a controlled rectifier to limit the transient time of the commuting capacitor during commutation. Energy stored in the commuting capacitor is used to commute the inverter's power controlled rectifiers at predetermined times, and energy stored in the motor windings is transferred to the capacitor during the transient period of commutation to prepare the capacitor for the subsequent commutation. The inductor connected in shunt with the commuting capacitor increases the natural frequency of the LC circuit comprised of the commuting capacitor and the motor winding when the controlled rectifier connected in series with the inductor is gated conductive. In this manner, a reduction in the transient time of the capacitor is effected.

3,732,474
POSITIONING CONTROL SYSTEM FOR A MACHINE THAT PERFORMS WORK ON A MOVING PART

Ernest G. Anger, Wauwatosa; Giles J. Richards, Menomonee Falls; John F. Bloodgood, Fond du Lac, and Roy J. Geiger, Cedarburg, all of Wis., assignors to Square D Company, Park Ridge, Ill.

Division of Ser. No. 146,110, May 24, 1971, Pat. No. 3,686,556. This application May 1, 1972, Ser. No. 248,944
Int. Cl. H02p *5/06*
U.S. Cl. 318—257 **6 Claims**

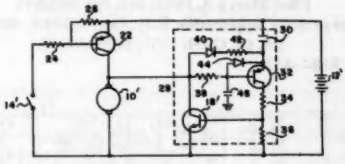


A programmable and manually operable control system for controlling the position of a machine relative to a workpiece so the machine may perform work at various locations on the workpiece while the workpiece is moved by the conveyor. The system includes a pair of synchro resolvers which provide output signals indicative of the position of the machine relative to a datum position and a pair of synchro resolvers which provide output signals indicative of the position of the conveyor relative to the datum position. The outputs of the machine indicating resolvers provide the inputs to the conveyor indicating resolvers and the outputs of the conveyor indicating resolvers are compared with command signals that are generated by a continuously recycling counter which has been preset by signals from a memory so the displacement between selected locations on the workpiece and the machine is electrically measured without using differential mechanical gearing. The control system is arranged so the machine will move synchronously with the workpiece, independently of the workpiece, and synchronously with the workpiece while the machine is moving from one preprogrammed location to a new preprogrammed location on the workpiece.

3,732,475
MOTOR CONTROL CIRCUIT

Leonardus Johannes Geerling, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed June 28, 1971, Ser. No. 158,923
Int. Cl. H02r *3/14*
U.S. Cl. 318—275 **8 Claims**

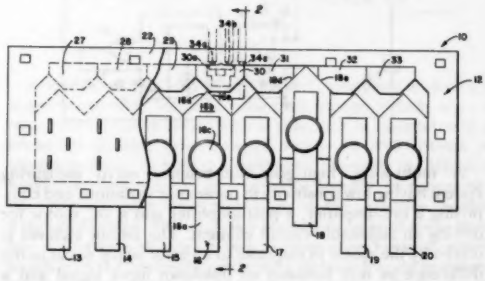


A motor control circuit for rapidly starting and stopping a direct current motor in relation to a start-stop switch operation for energizing and de-energizing the motor is disclosed. The motor control circuit preferably includes a plurality of semiconductor switching means for controlling the power application thereto and also for applying dynamic braking thereto. The dynamic braking circuit means automatically shunts the armature of the motor for a predetermined time to be long enough to stop the motor when the start-stop switch disconnects the power thereto. The dynamic braking circuit means is energized by a separate power source for the predetermined time rather than the electromotive force generated from the motor.

3,732,476
LOW COST SWITCHING ARRANGEMENT FOR APPLIANCE MOTOR SPEED CONTROL

Carmen P. Cairelli, Farmington, Conn., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Continuation-in-part of Ser. No. 858,431, Sept. 16, 1969, abandoned. This application May 21, 1971, Ser. No. 145,925
Int. Cl. H01h *9/26*
U.S. Cl. 318—305 **11 Claims**



A switching arrangement for a motor control system for a small appliance such as a blender is provided which includes a

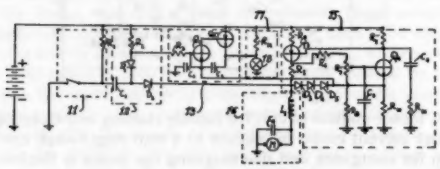
housing and a plurality of longitudinally movable, push button-operated switch actuators located therein. Each actuator carries a switch contact which, together with a corresponding set of contacts associated with the housing, forms a control switch. The actuators are adapted to cooperate with a plurality of laterally displaceable blocks to provide positive lock-out of the other actuators when one actuator is depressed unless a further actuator is positively actuated. The control switches operated by the actuators control the energization of the stator windings associated with the motor and a contact located on one of the blocks together with a housing-mounted contact forms a range switch for controlling the connection of a diode into the motor control circuit. The provision of two taps on one stator winding enables a system of eight actuator-operated control switches and the range switch to provide seven motor speeds as well as disconnection of the motor.

3,732,477

SIGNALLING AND CONTROLLING DEVICE FOR MAGNETIC TAPE APPARATUS

Rodolfo Cicatelli, Rome, Italy, assignor to Autovox S.p.A., Rome, Italy

Filed March 3, 1969, Ser. No. 803,691
Claims priority, application Italy, Oct. 9, 1968, 40331 A/68
Int. Cl. G03b *1/02*; **B65h** *59/38*
U.S. Cl. 318—463 **2 Claims**



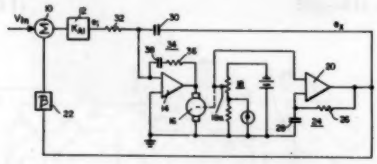
An apparatus for monitoring various conditions of tape feed in a magnetic tape transport as indicated by the take-up reel speed. A commutator detects the speed of the take-up reel and controls a multivibrator which deactivates the tape transport drive motor and flashes an alarm lamp when the take-up reel speed, as represented by the detector output, deviates from a preselected norm.

3,732,478

HIGH GAIN NULL-BALANCE SERVO SYSTEM

Samuel J. MacMullan, Newtown, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Continuation-in-part of Ser. No. 126,667, March 22, 1971, abandoned. This application April 3, 1972, Ser. No. 240,637
Int. Cl. G05b *5/01*
U.S. Cl. 318—616 **29 Claims**



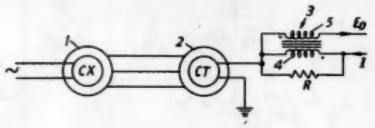
A multi-loop, high-gain null-balance servo measuring system having low sensitivity to parameter variations and comprising a pre-amplifier, a post-amplifier and a DC motor for driving an adjustable circuit element. The circuit element is driven by the motor in response to an error signal equal to the difference at null between an unknown input signal and a restoring signal provided by the overall system or outer loop feedback which represents the position of the adjustable circuit element. Reactive means are provided for establishing at least one inner loop feedback path for applying velocity and acceleration signal components to the input of the post-amplifier.

3,732,479

SYNCHROS

Willis Guy Wing, Glen Head, N.Y.; George Edward March Baker, and Rodney Frank Smith, both of Crowthrone, England, assignors to Sperry Rand Limited, London, England

Continuation-in-part of Ser. No. 820,584, April 30, 1969, abandoned. This application June 11, 1970, Ser. No. 45,528
Int. Cl. G05b *11/12*
U.S. Cl. 318—654 **6 Claims**



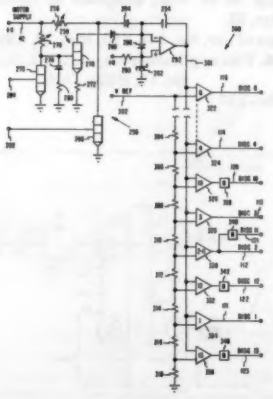
A synchro-torquing device having a control transmitter synchro, a control receiver synchro connected to receive a data output signal from the transmitter synchro, and means for supplying a torquing current to the receiver synchro, electrical means being provided to obviate the effect of the torquing current on the data signal output from the receiver, whereby there is provided a control synchro system from which can be obtained current-controlled torque outputs from either transmitter or receiver without having to employ a separate torque motor.

3,732,480

OPEN LOOP STEPPING MOTOR ACCELERATION-DECELERATION CONTROL

Kenneth E. Hendrickson, Rochester, and Larry F. Mattson, Pine Island, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 1, 1971, Ser. No. 120,031
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **16 Claims**



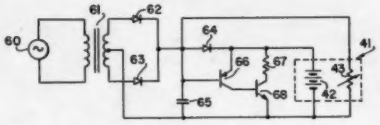
A logic control method and system for controlling the operation of a stepping motor having a known load to provide incremental motion of the motor without feedback. Time is measured whenever the motor is accelerating or decelerating and pulses are generated whenever predetermined periods of time have passed. The pulses are used to selectively energize windings of the motor in sequence to provide maximum acceleration; to reach running velocity without excessive

overshoot or hunting; and to provide controlled deceleration to bring the motor to rest at any one of a plurality of equilibrium angles.

3,732,481
METHOD AND APPARATUS FOR CHARGING BATTERIES

Joseph A. Mus, 3 Maple Way, Woodbury, N.Y.

Filed May 7, 1970, Ser. No. 35,352
Int. Cl. H02j 7/10
U.S. Cl. 320—14 **2 Claims**

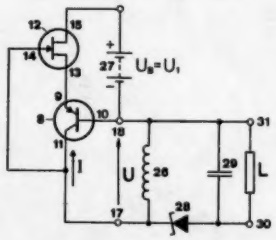


A method and apparatus for rapidly charging a battery. During the charging process, the battery is caused to accept and store the desired charging current by producing discharge pulses whose rate and/or durations vary in accordance with the relative magnitudes of the charging current and the acceptance current level of the battery.

3,732,482
TWO TERMINAL NETWORK WITH NEGATIVE IMPEDANCE

Alois Marek, Nussbaumen, Switzerland, assignor to Brown, Boveri & Company Limited, Baden, Switzerland

Division of Ser. No. 122,058, March 8, 1971, abandoned. This application May 30, 1972, Ser. No. 257,603
Claims priority, application Switzerland, March 23, 1970, 4329/70
Int. Cl. H02m 3/22
U.S. Cl. 321—2 **5 Claims**

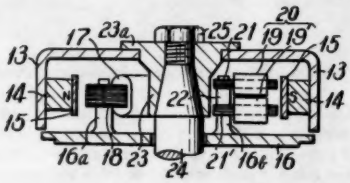


The present negative impedance two terminal network is embodied by two three terminal amplifiers, for example, one of which is a field effect transistor and the other is a bi-polar transistor, wherein the emitter-collector circuit of the bi-polar transistor and the source-drain circuit of the field effect transistor are connected in series with each other. The two terminals of the network are formed by the base and by the collector of the bi-polar transistor. Said collector is also connected to the gate terminal of the field effect transistor. A control voltage source is preferably connected between said base of the bi-polar transistor and the drain terminal of the field effect transistor, whereby said negative impedance is differentially adjustable by varying the control voltage.

3,732,483
MAGNET-TYPE AC GENERATOR FOR A BREAKERLESS-TYPE IGNITION SYSTEM

Mitsuo Katsumata, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Sept. 20, 1971, Ser. No. 182,076
Claims priority, application Japan, Sept. 21, 1970, 45/92857; Oct. 22, 1970, 45/104267; June 14, 1971, 46/51018
Int. Cl. H02p 9/00
U.S. Cl. 322—91 **15 Claims**

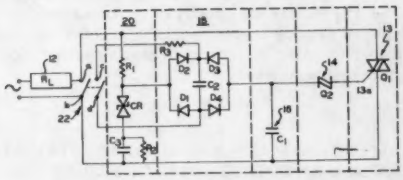


A magnet-type AC generator for a breakerless-type ignition system comprising a capacitor, an ignition coil including primary and secondary coils, a thyristor for discharging said capacitor through the primary coil of said ignition coil and a spark plug connected to the secondary coil of said ignition coil in which said generator comprises a stator including a capacitor charging winding or windings and a thyristor firing winding or windings, and a rotor including a multi-pole magnetic field means which has a plurality of poles for cooperating with said capacitor charging and thyristor firing windings.

3,732,484
DELAYED ACTION LOAD SWITCH

Joseph V. McKenna, Franklin Lakes, N.J., assignor to McWilker Enterprises, Little Falls, N.J.

Filed Oct. 20, 1971, Ser. No. 190,966
Int. Cl. G05f 3/04
U.S. Cl. 323—19 **4 Claims**



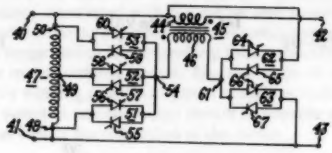
A delayed-action load switch for A-C operation including a trigger-controlled bilateral solid-state power switch, e.g., a triac, connected in series with a load, and in parallel with a manually-operable on-off switch across an A-C source. A charge-storage capacitor discharges through a bilateral breakover device (e.g., an avalanche switch) to trigger the triac to conduction when the charge on the capacitor reaches a threshold value. The capacitor is charged on each cycle from the A-C source through a bias accumulation network which builds up a D-C potential, increasing with each cycle in opposing the charging of the capacitor so that the threshold value is attained progressively later in each cycle and the proportion of the cycle during which the triac is conductive is gradually reduced to zero.

3,732,485

ELECTRICAL APPARATUS HAVING INVERSE PARALLEL CONNECTED PAIRS OF THYRISTORS

Clarence J. Kettler, Becket, Mass., assignor to General Electric Company

Filed Dec. 29, 1971, Ser. No. 213,334
Int. Cl. G05f 1/30
U.S. Cl. 323—43.5 S 2 Claims



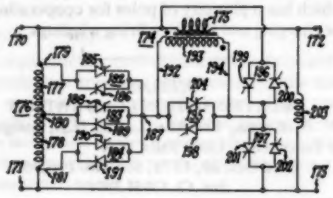
Voltage regulator apparatus for an alternating current electrical system which includes a secondary of a transformer connected in series with the line. A voltage of either polarity or no voltage is applied to the primary of the transformer through a plurality of pairs of inverse parallel connected thyristors. The thyristors are gated in such an order so as to assure commutation of any prior conducting thyristor.

3,732,486

ELECTRICAL APPARATUS WITH THYRISTOR CIRCUIT

Charles W. Schoendube, Lee, Mass., assignor to General Electric Company

Filed Dec. 29, 1971, Ser. No. 213,338
Int. Cl. G05f 1/20
U.S. Cl. 323—43.5 S 6 Claims



Voltage regulator apparatus for an alternating current electrical system which includes a secondary of a transformer connected in series with the line. A voltage of either polarity or no voltage is applied to the primary of the transformer through a plurality of pairs of inverse parallel connected thyristors. The thyristors are gated in an order to assure commutation of any prior conducting thyristor.

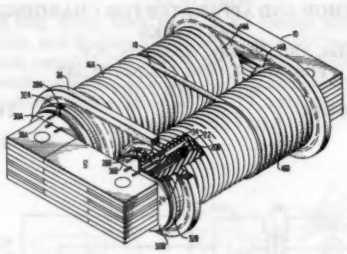
3,732,487

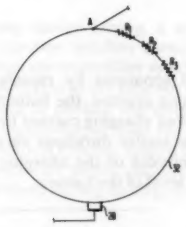
METHOD AND APPARATUS FOR ELECTRICALLY COUPLING AN OUTPUT VOLTAGE FROM A VARIABLE INDUCTION DEVICE TO LOAD

Donald S. Rozelle, Owego, N.Y., assignor to Magnetech Industries, Inc., Montrose, Pa.

Filed Aug. 12, 1971, Ser. No. 171,206
Int. Cl. H01f 21/04
U.S. Cl. 323—54 25 Claims

Apparatus for electrically connecting the output voltage from a movable coil of a variable induction device to an external load. The movable coil is preferably mounted on two spaced, rotatable drums and is linked by a cyclically varying magnetic flux. The resulting output voltage is variable in response to rotation of the drums. A ring and brush arrangement, one of which moves with the movable coil, establishes a current path between the movable coil and the external load through wiping engagement therebetween. The ring is a closed, electrically conductive loop preferably having a predetermined electrical resistance between points spaced circumferentially thereof, and is positioned in flux linking relation to the cyclically varying magnetic flux operatively associated with the movable coil. The electromotive force in-





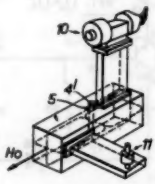
duced into the ring thereby modifies the output voltage generated by the movable coil in response to rotation of the movable coil providing a highly accurately selectable output voltage.

3,732,488

ELECTRON SPIN INDUCTORS AT MICROWAVES

Cafiero Franconi, Via delle Epodi 13B, Cagliari, Italy

Continuation of Ser. No. 863,970, Oct. 10, 1969, abandoned.
This application April 13, 1972, Ser. No. 243,796
Claims priority, application Italy, Oct. 5, 1968, 40247 A/68
Int. Cl. G01n 27/78
U.S. Cl. 324—.5 R 11 Claims



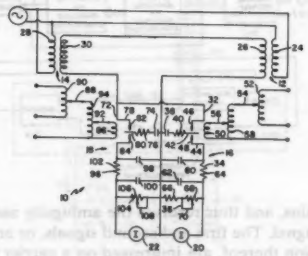
Resonant structures supporting two decoupled degenerate orthogonal modes of oscillation of microwaves for magnetic resonance spectrometers employing the Bloch spin induction principal are disclosed. The bimodal microwave cavities used therein include a region where the sample of matter containing the spins under study is placed within the bimodal cavity to be stimulated by the microwave field of the first mode. The energy emitted by the stimulated spins is extracted from the second mode of said bimodal cavities. Balanced mode coupling to the cavities and multiple bimodal cavity systems sharing a unimodal region are disclosed together with means for reducing the cross coupling of the orthogonal modes inside the bimodal structure.

3,732,489

TRANSFORMER PHASE ANGLE ERROR AND RATIO CORRECTION FACTOR TRANSDUCER

Jerry G. Nelson, Romulus Township, Wayne County, and Alfredo Francesconi, Detroit, both of Mich., assignors to The Detroit Edison Company, Detroit, Mich.

Filed Feb. 7, 1972, Ser. No. 223,918
Int. Cl. G01r 31/06; G01r 29/20
U.S. Cl. 324—55 10 Claims



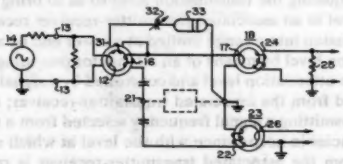
An electronic circuit for and method of simultaneously providing the ratio correction factor and phase angle error for a test transformer relative to a standard transformer by continuously determining the vector components of the signal resulting from comparison of the voltage across the secondary windings of the standard transformer, the ratio correction factor and phase angle error of which are known, and a test transformer, the ratio correction factor and phase angle error of which is unknown, by sampling a plurality of single cycles of the resulting signal voltage at predetermined points in the resulting signal 90° displaced from each other at each of which one of the ratio correction factor and phase angle error provide no signal voltage and filtering the sample signals to provide direct current signals varying over time which are proportional to the ratio correction factor and phase angle error of the test transformer relative to the standard transformer.

3,732,490

IMPEDANCE PROBE FOR SWEPT NETWORK ANALYZER SYSTEM

Julius K. Botka, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 7, 1971, Ser. No. 150,702
Int. Cl. G01r 27/00
U.S. Cl. 324—57 R 13 Claims



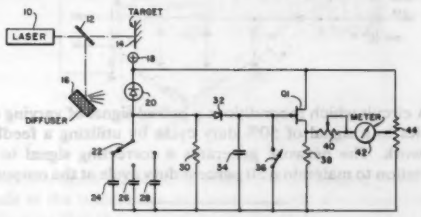
A probe for use with a network analyzer for measuring the impedance and phase of a network or component under test over a wide swept frequency band comprising three transformers; a driver transformer for supplying power to a current loop including the test terminals connected across the device under test, a current measurement transformer in the current loop for measuring the current supplied from the driver transformer to the device under test, and a voltage measurement transformer coupled across the test terminals for measuring the voltage across the device. An adjustable balancing circuit including an additional winding on the driver transformer is utilized for balancing out the effect of parasitic capacitance across the test terminals. A small coupling circuit is provided between the current loop and the voltage measurement channel to compensate for the slight voltage drop in series with the device under test due to the probe tip socket and also for undesired leakage between the driver, current, and voltage measurement circuits of the probe structure. An annular grounding ring utilized on the measurement end of the probe is included in the current measurement circuit and the voltage measurement circuit, equal portions of the ring being included in each of said two circuits as measured from the null or midpoint of the grounding ring.

3,732,491

LASER ENERGY MONITOR CIRCUIT

Albert D. Battista, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 21, 1971, Ser. No. 108,367
Int. Cl. G01r 19/16, 31/00
U.S. Cl. 324—102 1 Claim



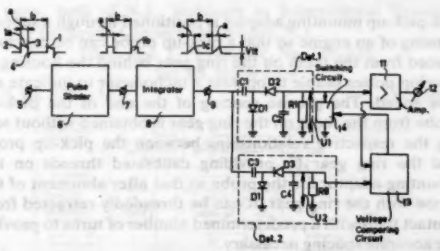
A laser energy monitor circuit. A fixed fraction of the energy output of a laser is diffused and then directed to a photodiode, and the diode output current is integrated. The integrated signal is transferred to a peak detector which, in turn, drives an FET transistor. The output of the transistor, which may persist for many minutes even in the case of a nanosecond laser pulse, drives a meter and thus provides an extended visual indication of the energy in the pulse.

3,732,492

ELECTRIC FUEL INJECTION TESTER

Herman Robert Geul, Leiden, Netherlands, assignor to Sun Electric Corporation, Chicago, Ill.

Filed Sept. 3, 1970, Ser. No. 69,284
Int. Cl. G01r 19/16
U.S. Cl. 324—103 P 2 Claims

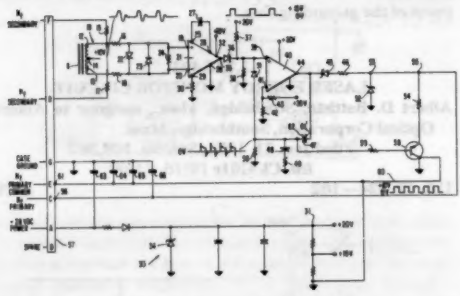


This invention relates to a device for measuring the varying time duration of opening of electronically controlled injection valves of fuel injection systems for internal combustion engines under actual running conditions. To this end, the electrical square wave pulses which control the opening of the valves are converted into sawtooth pulses with a peak amplitude which is proportional to the width of the control pulses, and thus with the duration of opening of the injection valves. This amplitude of the sawtooth pulses is measured and the resulting output signal is supplied to an indicating instrument of which the scale is marked in time units.

3,732,493
ELECTRICAL COMPENSATING CIRCUIT

William H. Pelkey, Winooski, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed March 12, 1971, Ser. No. 123,718
Int. Cl. G01p 3/48
U.S. Cl. 324—166 6 Claims

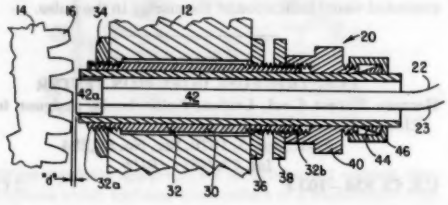


A circuit which reconditions a pulsed signal of varying duty cycles to a signal of 50% duty cycle by utilizing a feedback network. The network generates a correcting signal to any deviation to maintain a 50 percent duty cycle at the output.

3,732,494
PICK-UP ADAPTOR FOR SENSING SPEED

James W. Dragon, Arlington Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 63,095, Aug. 12, 1970, abandoned.
This application June 13, 1972, Ser. No. 262,215
Int. Cl. G01p 3/48
U.S. Cl. 324—173 6 Claims



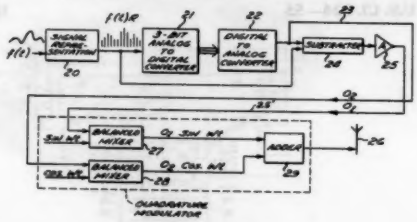
A pick-up mounting adaptor is positioned through a support housing of an engine so that a pick-up probe can be precisely spaced from the teeth on the ring gear behind the housing to develop pulses usable to operate a tachometer to indicate engine speed. The precise spacing of the end of the pick-up probe from the teeth on the ring gear is obtained without seeing the respective relationships between the pick-up probe and the ring gear by providing calibrated threads on the mounting adaptor for the probe so that after abutment of the probe with the ring gear, it can be threadedly retracted from contact therewith a predetermined number of turns to provide the accurate spacing necessary.

3,732,495
SIGNAL TRANSMISSION AND MODULATION TECHNIQUE THEREFOR

Daniel D. McRae, West Melbourne; Carmen J. Palermo, Melbourne Beach, and Majella G. Pelchat, Indialantic, Fla., assignors to Radiation, Inc., Melbourne, Fla.

Filed July 20, 1970, Ser. No. 56,527
Int. Cl. H04b 1/00
U.S. Cl. 325—60 12 Claims

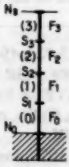
Two separate signals are derived as indicative of the information content of each of a plurality of discrete time samples of an input waveform. One of these signals effectively constitutes a stretching of the respective sample, and hence of the input waveform, by designating the deviation of the sample amplitude (or other selected parameter) from an unknown one of a set of discretely increasing reference levels greater in number than two, in a magnified format. The second signal designates the reference level with respect to which the deviation pertains, and thus resolves the ambiguity associated with the first signal. The first and second signals, or an appropriate combination thereof, are impressed on a carrier for transmission to a remote receiving station. Accompanying noise resulting from transmission is compressed in a ratio equal to the ratio of compression of the first signal at the receiving station, to reconstruct the original waveform.



3,732,496
RADIO TRANSMITTER-RECEIVED INCLUDING MEANS FOR AUTOMATICALLY ADJUSTING THE TRANSMISSION LEVEL

Marcel Louis Boyer, Chatillon, France, assignor to C.I.T.-Compagnie Industrielle Des Telecommunication, Paris, France

Filed Oct. 5, 1970, Ser. No. 78,100
Claims priority, application France, Oct. 3, 1969, 6933910
Int. Cl. H04b 1/62
U.S. Cl. 325—62 20 Claims



A radio transmitter-receiver including means for automatically adjusting the transmission level so as to bring the reception level in an associated transmitter-receiver receiving such transmission into a range limited at a lower end by a reference reception level by means of an attenuator providing a stepped variable attenuation level and controlled by a signal frequency received from the associated transmitter-receiver; and means for transmitting a signal frequency selected from a set of such frequencies in accordance with the level at which a transmission from the associated transmitter-receiver is received by means of a selector device comprising a set of threshold circuits corresponding to thresholds between said reference reception level and a saturation level limiting the range at an upper end.

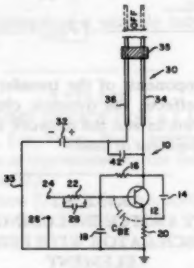
3,732,497
TRANSISTOR TRANSMITTER USING VARIABLE LINE LENGTH TUNER

James P. Campman, Silver Spring, Md., assignor to Vidar Laboratories, Inc., Kensington, Md.

Filed Feb. 10, 1971, Ser. No. 114,156
Int. Cl. H04b 1/04
U.S. Cl. 325—105 3 Claims

A transistor controlled transmitter whose modulation process occurs in the square law region by which is achieved

extremely sensitive frequency modulation without the necessity of pre-amplifying stages for the modulating signal. A resonant circuit consists of an LC combination, the reactance of which is variable to change the oscillation frequency in the continuous mode. The variable reactance has physical dimensions which have been calculated to give a frequency of oscillation selectively over the FM band with maximum sensitivity and frequency stability. Other functions accomplished by the



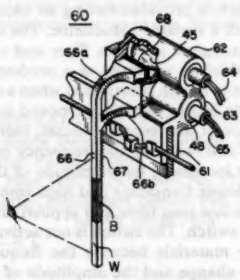
tuning means concomitant with the act of tuning include electromagnetic radiation of the modulated carrier wave with an essentially omnidirectional pattern, resonance of sufficient quality to smoothly adjust the frequency of oscillation, and control means having a unique position which obviates the need for a separate on-off switch.

3,732,498

FINE-TUNING AND STEREO INDICATOR SYSTEM

Orval E. Beckman, Wheaton, and Walter Klymkiw, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 12, 1971, Ser. No. 188,051
Int. Cl. H04b *1/16*
U.S. Cl. 325—398 **3 Claims**



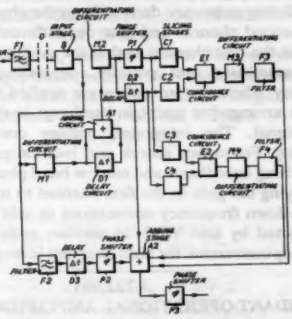
A fine-tuning and stereo indicator system for an AM-FM radio receiver capable of receiving FM stereo broadcast signals. The indicator system utilizes two lamps integrally mounted within a dial pointer carriage assembly to illuminate a dial pointer exhibiting light-conductive properties. Whenever a monophonic radio signal is received, the dial pointer glows with a variable intensity representative of the received signal-strength, i.e., fine-tuning. Upon receiving a stereophonic broadcast signal, the fine-tuning lamp is extinguished, and the stereo indicator lamp is fully illuminated and subsequently filtered to impart a second distinctive color (e.g., red) to the dial pointer indicative of stereo reception.

3,732,499

METHOD FOR TRANSMITTING PULSE LIKE SIGNALS

Curt Danell, Huddinge, and Peder Magnus Rodhe, Stockholm, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed May 20, 1971, Ser. No. 145,408
Claims priority, application Sweden, June 12, 1970, 8170/1970
Int. Cl. H04b *15/00*
U.S. Cl. 328—165 **6 Claims**



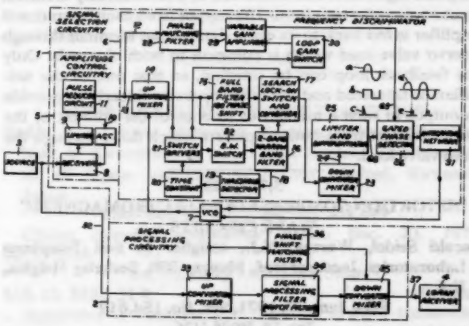
This invention relates to a method of processing pulse like signals at the transmitter and receiver ends of a transmission medium so that the slope of the flanks of the transmitted pulses exceeds those transmittable by known methods by a medium with a limited band width. This is achieved by superposing overshoots on the pulses at the transmitter end of the transmission medium. These overshoots which have a frequency within the transmission band of the medium and consequently can be transmitted undistorted by the medium contain information about the slope of the flanks and amplitude of the original pulses at the transmitter end. These overshoots are then separated from the transmitted distorted pulses at the receiver end and a reshaping of the pulses is accomplished upon which frequency components are obtained from the overshoots, the amplitude and the time- and phase position of which have such values that the frequency components together with the transmitted distorted pulses form new pulses which well conform to the original pulses.

3,732,500

SELECTION AND PROCESSING SYSTEM FOR SIGNALS, INCLUDING FREQUENCY DISCRIMINATOR

Milton Dishal, Upper Montclair, and Henri Baran, Parsippany, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 27, 1968, Ser. No. 763,225
Int. Cl. H03b *1/04*
U.S. Cl. 328—167 **17 Claims**



A signal selection and processing system for use with a broadband LORAN receiver in which the average of the

strongest interfering signal having a predetermined duty cycle sets the AGC level and, via a special frequency discriminator, controls the frequency of a voltage controlled oscillator (V-CO). The VCO output is used to shift the entire band of input frequencies so that said strongest signals fall into the attenuating notch of a notch filter while passing the other signals to the LORAN receiver.

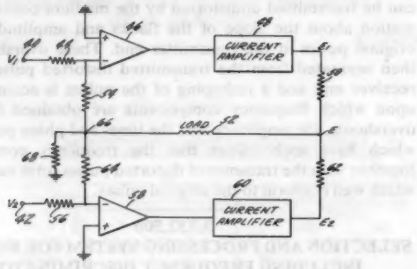
In said discriminator, signals are transmitted through one channel in which a certain phase shift is produced and a second channel which also produces the same phase shift plus an additional phase shift which varies 180° over the band of interest. Gating pulses are derived from the phase shifted signals in the second channel and gate out different portions of the signals in the first channel so that the output pulses are of different amplitude and polarity, depending on the input frequency. These output pulses are applied to an integrating network arranged to maintain its charge in the absence of an input signal. The integrated voltage controls the VCO frequency. Frequency search and lock-on are accomplished by switching broadband and narrow band phase shifting filters and varying the gain in the first channel to maintain stability. Up-and-down frequency conversions in said second channel are effected by said VCO. In another embodiment a single frequency conversion for both channels is employed.

3,732,501

REDUNDANT OPERATIONAL AMPLIFIER CIRCUIT FOR SERVO CONTROL SYSTEMS

William C. Fischer, Jr., Monroe, Conn., and Frank W. Symons, Jr., Pennsylvania Furnace, Pa., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 27, 1971, Ser. No. 183,925
Int. Cl. H03f 3/68
U.S. Cl. 330—1 A **4 Claims**



A redundant type servo valve control system is disclosed which employs a circuit comprising two simultaneously operating control loop channels for protecting against a failure in the control channel. Each channel includes an operational amplifier having one input terminal grounded and the other input terminal connected to a substantially identical input source of error signal. The output from each operational amplifier is fed back to its error signal input terminal through a servo valve load which is common to both channels. Only one feedback loop can be satisfied, so that one of the amplifiers is saturated and the other operates linearly to provide an output in such a manner as to control the amount of the output current from both amplifiers which flows through the servo valve load.

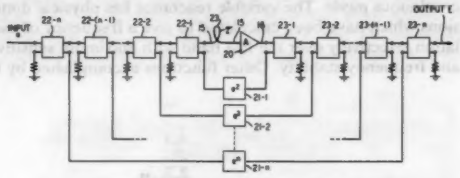
3,732,502

DISTORTION COMPENSATED ELECTROMAGNETIC WAVE CIRCUITS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 17, 1971, Ser. No. 154,017
Int. Cl. H03f 1/26
U.S. Cl. 330—149 **7 Claims**

This application described predistortion and postdistortion compensation arrangements wherein compensation is restricted to the nonlinear portion of the transfer characteristic of the network to be linearized. Accordingly, the compensating signal components employed correspond solely to



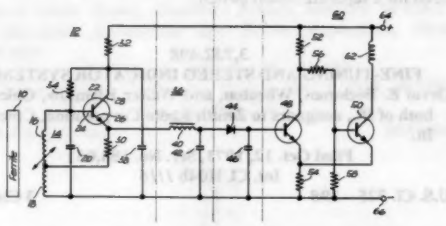
the distortion components of the transfer characteristic. To avoid dispersion effects, the dynamic characteristics of the compensating networks and the network to be linearized are substantially independent of time.

3,732,503

PROXIMITY SWITCH INCLUDING VARIABLE FREQUENCY OSCILLATOR WITH FERRITE CONTROL ELEMENT

Werner Rapp, Suedmaehrer Str. 26, 7340 Geislingen, and Werner Albrecht, Stuttgarter Str. 23, 7022 Leinfelden, both of Germany

Continuation-in-part of Ser. No. 8,493, Feb. 4, 1970, abandoned. This application Feb. 11, 1972, Ser. No. 225,453
Int. Cl. G08c 21/00; H01f 21/06; H03b 5/12
U.S. Cl. 331—65 **5 Claims**



A proximity switch is provided having an oscillator with a resonant circuit with a variable inductance. The output of the oscillator is fed through a low pass filter and rectifier to a switching circuit which is activated at a predetermined amplitude. The proximity switch is activated when a control body of non-magnetizable ferrite material is moved in close proximity to the inductor of the resonant circuit, thereby increasing the inductance and reducing the frequency of oscillation, and maintaining or increasing the amplitude of the output of the oscillator, the lower frequency and high amplitude signal being passed by the low pass filter and applied after rectification to activate the switch. The switch is not activated by electrically conductive materials because the frequency of the oscillator does not change and the amplitude of its output is damped, and it is not actuated by magnetic materials such as steel chips or permanent magnets because of high eddy current and hysteresis losses induced into the resonant circuit and damping of its output which fail to provide the output necessary to trigger the switch.

3,732,504

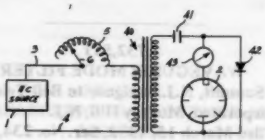
POWER SUPPLY CIRCUIT FOR A HEATING MAGNETRON

Melvin L. Levinson, 1 Meinzer Street, Avenel, N.J.

Continuation-in-part of Ser. No. 608,886, Jan. 12, 1967, abandoned. This application July 14, 1969, Ser. No. 841,507
Int. Cl. H03b 9/10
U.S. Cl. 331—86 **4 Claims**

A power supply circuit for varying the power output of a heating magnetron which includes controlling a variable in-

ductance to tune a capacitance to resonance to vary the



power, and which comprises a variable inductance in series with the magnetron.

3,732,505

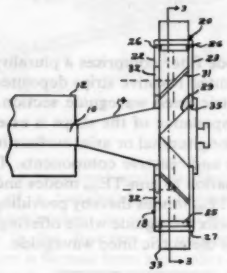
END PUMP DEVICE FOR A LASER

Paul M. Freedman, Las Vegas, Nev., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 7, 1972, Ser. No. 260,566

Int. Cl. H01s *3/09*

U.S. Cl. 331—94.5 **2 Claims**



A light emitting diode system for pumping a solar pumped laser, having a housing attached to the light concentrating cone of the solar pumped laser with a removable light reflecting cone for directing light from light emitting diodes into the light concentrating cone. A plurality of light emitting diodes are positioned around the light reflecting cone with a filter element being positioned between the diodes and the reflecting cone.

3,732,506

IMPULSE DURATION MODULATOR

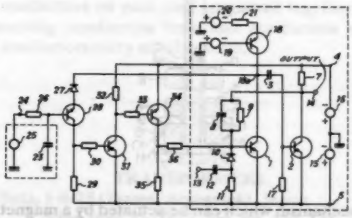
Michel Jean-Marie Dupuy, Livry-Gargen, France, assignor to Roussel-Uclaf, Paris, France

Filed Feb. 2, 1971, Ser. No. 111,984

Claims priority, application France, Feb. 10, 1970, 7004580

Int. Cl. H03k *7/08*

U.S. Cl. 332—9 T **5 Claims**



An impulse modulator including a monostable multivibrator having a charging capacitor, a voltage comparator, a constant current generator and first and second modulating voltage sources. The voltage comparator insures that the multivibrator rapidly changes from its astable state to its stable state, and the duration of the astable period is proportional to the ratio of the first modulating voltage, and a constant voltage, to a second modulating voltage. Two modulators may be combined in an anticoincidence circuit to make the combined modulator output strictly proportional to the ratio of the first and second modulating voltages.

3,732,507

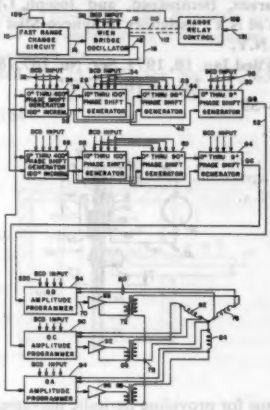
AC POWER SUPPLY HAVING COMPUTER CONTROLLED FREQUENCY AND PHASE AND AMPLITUDE

Robert A. Christiansen, and Dhanikodi Balasubramaniam, both of San Diego, Calif., assignors to Californin Instruments Co., a Division of Aiken Industries, Inc., San Diego, Calif.

Filed Oct. 18, 1971, Ser. No. 190,246

Int. Cl. H03c *3/02*

U.S. Cl. 332—16 R **19 Claims**



An AC power supply for supplying single phase or multiple phase AC power with frequency, phase, and amplitude accurately programmed by digital computer command. The power supply utilizes a controlled pair of signals having a constant phase difference for all programmed frequencies, which are restructured to provide a programmed phase signal independent of the frequency by utilizing this input phase difference. The signals are increased or decreased in amplitude by an amplitude programmer that utilizes both a feedback signal from the load and a programmable forward gain amplifier to provide a rapid and controlled programmed amplitude output of the load. The power supply also utilizes a fast range changing circuit which allows the power supply to select frequency quickly in decade steps.

3,732,508

STRIP LINE TO WAVEGUIDE TRANSITION

Yukio Ito, Tokyo; Hidemitsu Komizo; Takeshi Okamura, both of Kawasaki-shi, and Yasusi Simizu, Hiroshima-shi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 16, 1971, Ser. No. 208,609

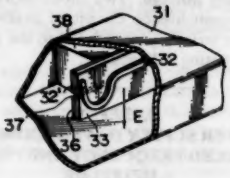
Claims priority, application Japan, Dec. 23, 1970, 45/117120

Int. Cl. H01p *1/16, 3/08, 5/08*

U.S. Cl. 333—21 R **10 Claims**

Apparatus is disclosed for coupling a wave transmitted between a waveguide and a strip line. In particular, the strip line is composed of a conductor, a dielectric substrate and an earth (or ground) conductor. In accordance with teachings of this invention the coupling is achieved by inserting a slot mode

between the strip propagation mode and the waveguide mode in a strip line to waveguide transition. More specifically, a slot



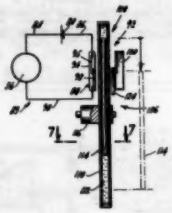
is formed in the earth conductor of the strip line and the slot is disposed to intersect or to traverse the strip line conductor to achieve the desired coupling.

3,732,509

APPARATUS TO PROVIDE PERIODIC MOVEMENT

Leroy F. Florant, Hempstead, and Joseph Glickstein, New York, both of N.Y., assignors to Syncro-Mist Controls, Inc., New York, N.Y.

Filed Jan. 18, 1971, Ser. No. 107,189
Int. Cl. H01h *7/02*
U.S. Cl. 335—59 **13 Claims**



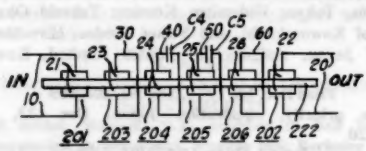
An apparatus for providing periodic movement operatively associated with an aerosol dispensing container to actuate the dispenser. The periodic movement apparatus includes a battery-powered drive system which moves an actuating member. Timing means included in the periodic movement apparatus are associated with the drive system so that the actuating member moves at predetermined periodic intervals. The aerosol dispensing container and the entire apparatus for providing periodic movement are contained within a single portable, self-contained housing.

3,732,510

MULTISECTION PRECISION-TUNED MONOLITHIC CRYSTAL FILTERS

Warren Perry Mason, West Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 12, 1970, Ser. No. 79,881
Int. Cl. H03h *7/10, 9/00*
U.S. Cl. 333—72 **9 Claims**



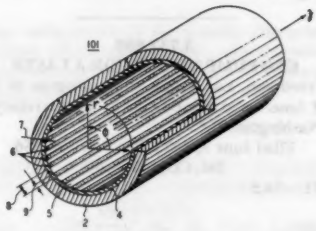
In a monolithic crystal filter characterized by a combination of mass loading and acoustic coupling, passband shaping is enhanced by shunting one or more intermediate electrode pairs with a reactive element. Precision tuning is achieved by varying the plating on a desired intermediate filter section with adjacent sections either open-circuited or reactively shunted.

3,732,511

WAVEGUIDE MODE FILTER

Chi Fu Den, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed March 15, 1972, Ser. No. 234,867
Int. Cl. H01p *1/16, 1/22*
U.S. Cl. 333—95 R **7 Claims**



A waveguide mode filter comprises a plurality of very thin, narrow, axially oriented resistive strips deposited on the inner surface of a dielectric lined waveguide section. The circumferential surface impedance of the strips is essentially purely reactive while the longitudinal or axial surface impedance has significant resistive and reactive components. Thus the strips present high attenuation to non-TE_{0N} modes and low attenuation to the desired TE_{01} modes thereby providing the same filtering function as helix waveguide while offering the manufacturing advantages of dielectric lined waveguide.

ERRATUM

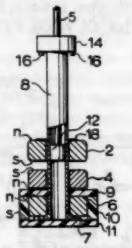
For Class 335—59 see:
Patent No. 3,732,509

3,732,512

TRIP MECHANISM

Donald W. Puttick, 473 Brierwood Avenue, Ottawa, Ontario, Canada

Filed Nov. 22, 1971, Ser. No. 200,877
Claims priority, application Great Britain, Dec. 12, 1970, 59,192/70
Int. Cl. H01h *7/04*
U.S. Cl. 335—302 **11 Claims**



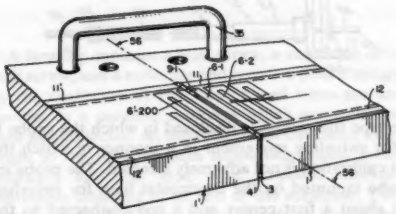
A trip mechanism which can be actuated by a magnet, by inertia, by a mechanical movement or by an electrical current, has powerful magnets in mutual repulsion constrained close together by the attraction of a short length of ferromagnetic material; this attraction balances the repulsion and allows energy to be stored in the magnetic field. When the balance is upset — which can be done in a number of ways — the magnet previously held by the short length of ferromagnetic material

is driven away by the stored energy and may be used to close a pair of circuit contacts.

3,732,513
POSITION-MEASURING TRANSFORMER AND SCALE MEMBER

Clair L. Farrand, Bronxville, N.Y., assignor to Inductosyn Corporation, Valhalla, N.Y.

Filed Oct. 14, 1971, Ser. No. 189,282
Int. Cl. H01f 21/04
U.S. Cl. 336—129 **5 Claims**



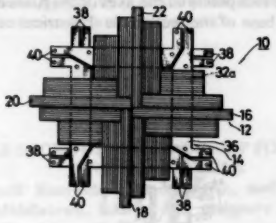
Disclosed is an improved scale winding member which is one member of a two-member position-measuring transformer. The two members are relatively movable with respect to each other in the direction of measurement. The scale winding member is formed from a plurality of individual units, frequently called bar scales or scale units. Each scale unit includes a winding section supported on a separate base. A plurality of the scale units are positioned end to end with the winding sections from each electrically interconnected to form the continuous scale winding. Each winding section includes active conductors, having a fine pitch, transverse to the direction of relative movement. The active conductors are connected in series by end conductors where the end conductors extend parallel to the direction of relative movement. Return conductors are positioned opposite and parallel to the end conductors to neutralize unwanted fields. The individual winding section on one scale unit is electrically connected to the individual winding section of an adjacent scale unit by pairs of interconnecting conductors. Each conductor in each pair is substantially identically arrayed in space to mate with the other conductor in the pair and each conductor conducts with a current equal to but in the opposite direction of the current in the other conductor of the pair to neutralize unwanted coupling. The pairs of conductors are formed with one conductor from one scale unit and the other conductor from the abutting scale unit. The interconnecting conductors from return conductors on each unit are paired together as are interconnecting conductors from end conductors so that all paired conductors carry equal current.

3,732,514
TRANSFORMERS

Ryoda Sato, 1-8-25 Ohama, Amagasaki, Japan

Filed June 30, 1971, Ser. No. 158,334
Claims priority, application Japan, July 7, 1970, 45/67768; Oct. 2, 1970, 45/86772
Int. Cl. H01f 27/28
U.S. Cl. 336—172 **8 Claims**

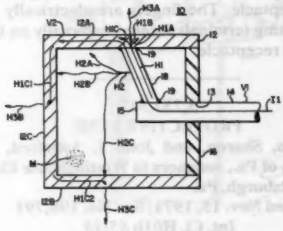
Electric transformers, such as for spot welding machines and the like, which have at least the secondary winding divided into sections of less than one turn so as to obtain a large current at a low voltage, such as one-half, one-third or one-fourth turns.



3,732,515
CURRENT LIMITING FUSE INCLUDING RADIALLY DISPOSED FUSE ELEMENTS

Donald D. Blewitt, Pittsburgh, and Woodrow G. Shaw, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1972, Ser. No. 229,363
Int. Cl. H01h 85/04
U.S. Cl. 337—166 **10 Claims**



A current limiting fuse having one or more fuse elements disposed for more efficient transfer of heat so that greater electrical current may be continuously conducted through the fuse for a given cross-section of fusible material. Two electrodes or terminals are provided, one of which is cup-shaped or which is tubularly shaped and closed by electrically conducting material at one end. The second electrode projects into the recess created by the cup-shaped electrode and is spaced from it. An electrically insulating support-cover or spacer is provided at the open end of the cup-shaped electrode. This spacer has a central hole or opening to accommodate the projecting electrode or terminal. An array or assembly of fuse elements is disposed upon the enclosed portion of the protruding electrode. Each fuse section is joined at its other end to the inner perimeter of the cup-shaped electrode. The fusible elements may be arranged as spokes on a wheel between a central hub and an outer ring, the central hub being mounted on the inwardly protruding electrode and the outer ring being disposed to make contact with the outer or cup-shaped electrode. The enclosure formed by the cup-shaped electrode, the insulating spacer and the protruding electrode is filled with a granular pulverulent such as quartz sand for electrical arc quenching.

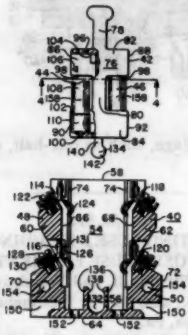
3,732,516
COMPACT CARTRIDGE-TYPE FUSE HOLDER

Jordan F. Puetz, Milwaukee, Wis., assignor to Square D Company, Park Ridge, Ill.

Filed Nov. 8, 1971, Ser. No. 196,342
Int. Cl. H01h 85/02
U.S. Cl. 337—194 **12 Claims**

A compact cartridge-type fuse holder assembly which is particularly adapted to be mounted adjacent a side wall of an

electromagnetic device. The assembly includes a receptacle and an insulating holder which positions one or two cartridge type fuses in the receptacle so the axes of the fuses extend perpendicular to a base of the receptacle. Electrical contact with



terminal portions of the fuse is made by fingers positioned within the receptacle. The fingers are electrically connected to wire connecting terminals located externally on the molded housing for the receptacle.

3,732,517

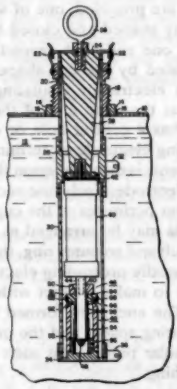
PROTECTIVE FUSE

August I. Keto, Sharon, and John J. Astleford, Jr., Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1971, Ser. No. 198,791

Int. Cl. H01h *85/38*

U.S. Cl. 337—278 **13 Claims**



A load break protective fuse assembly having arc snuffing means. The arc snuffing means seals the lower contact structure of the fuse assembly, when the fuse member is withdrawn, to prevent the escape of ionized gas into the fuse assembly casing. A de-ionizing chamber and a gate member having a hinged door thereon may be used in conjunction with the arc snuffing means.

3,732,518

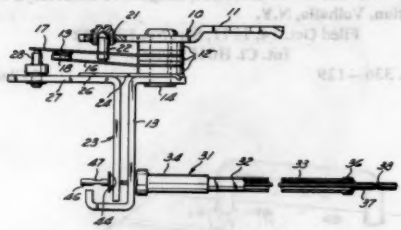
THERMOSTAT WITH MULTI-POSITION SENSING ELEMENT

Edward G. Them, and Gerald R. Wharton, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed July 13, 1972, Ser. No. 271,400

Int. Cl. H01h *37/36*

U.S. Cl. 337—394 **13 Claims**



A probe-type thermostat is disclosed in which the probe is mounted for swiveling movement in a manner in which the thermostat calibration is not adversely affected. The probe includes a tube mounted on the thermostat base for swiveling movement about a first center and a rod connected to the thermostat operator for swiveling movement about a second center. The two centers are substantially coincident when the switch operates, and the range of swiveling movement is arranged so that the probe remains substantially aligned with the locus of movement of the second center.

3,732,519

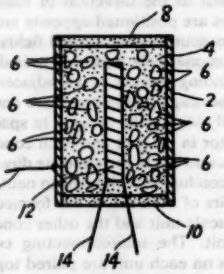
SEMICONDUCTOR GAS DETECTING DEVICE

Naoyoshi Taguchi, 6-8, 2-chome Hyuga, Tarumi-ku, Kobe, Japan

Filed Sept. 23, 1970, Ser. No. 74,749

Int. Cl. H01c *13/00*

U.S. Cl. 338—34 **7 Claims**



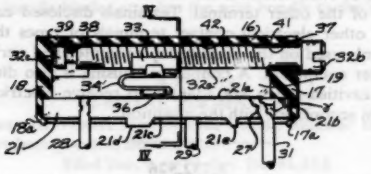
A gas detecting device formed of a porous, highly permeable, metal oxide semiconductor formed by mixing semiconductor particles with inorganic materials which will render the semiconductor highly porous or by intermixing the semiconductor with materials which can be evaporated or otherwise removed by heating to a temperature below the sintering temperature of the semiconductor. The resultant semiconductor material is contained within a suitable housing that will permit gases to flow readily through the semiconductor and appropriate electrodes are affixed to the semiconductor to measure a change in resistance in the presence of reducing gases. Heating means may be utilized to stabilize the resistance of the semiconductor material during operation and such heating means may comprise at least one of the electrodes.

3,732,520

VARIABLE RESISTANCE CONTROL AND METHOD OF ASSEMBLING SAME

John D. Van Benthuysen, and Thomas R. Beaver, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Jan. 2, 1969, Ser. No. 788,592
Int. Cl. H01c 9/02
U.S. Cl. 338—180 8 Claims



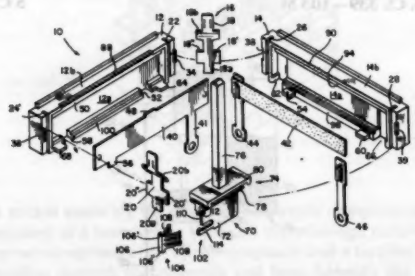
A housing encloses a lead screw, a contactor driven by the lead screw, and a collector and resistive path wipingly engaged by the contactor. A plurality of lead wires are anchored in cavities in a ceramic substrate which supports the resistive path and collector. At least one of the cavities is disposed at an angle to the resistive path supporting planar surface of the substrate and the lead wire disposed therein egresses therefrom adjacent to an end of the substrate. The threaded portion of the lead screw is supported in a journal bearing having a curved surface with a curvature that is approximately equal to or less than twice the reciprocal of the nominal diameter of the lead screw. The tail end of the lead screw is grooved and a thrust bearing integral with the housing interfits with the groove and prevents axial movement of the lead screw relative to the housing. A sealing member and the lead screw are assembled with the housing by positioning the sealing member on the lead screw and inserting the tail end of the lead screw through an opening while maintaining the longitudinal axis of the lead screw at an angle relative to the centerline of the opening. When the sealing member is compressed between the head of the lead screw and the housing, the tail end of the lead screw is moved in a direction transverse to the longitudinal axis of the lead screw so as to interfit the thrust bearing with the groove in the lead screw.

3,732,521

MOUNTING MEANS AND SLIDEABLE ELECTRICAL CONTACT FOR LINEAR POTENTIOMETER

Edgar F. Hauenstine, and George O. Puerner, both of Frankfort, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed May 3, 1971, Ser. No. 139,509
Int. Cl. H01c
U.S. Cl. 338—202 7 Claims



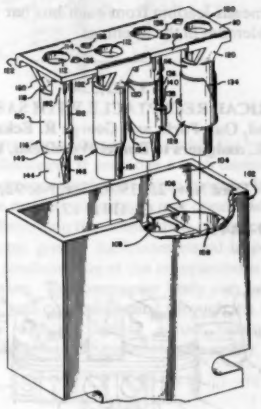
A slider is mounted in a slot and moveable lengthwise between a resistor and collector strip. The slider includes an electrical contact carrying blade extending between the resistor and collector strips and includes means to trap an electrical contact means to the blade. The housing for the potentiometer includes two cooperating members, the members being secured together by potentiometer mounting means engaging the two members at opposed ends.

3,732,522

MULTIPLE SOCKET TERMINAL STRIP FOR TERMINAL JUNCTION MODULE

Ronald Groff Hartwell, Hummelstown, and Arley Keener Miller, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed March 17, 1972, Ser. No. 235,695
Int. Cl. H01r 31/08
U.S. Cl. 339—19 9 Claims



A plurality of stamped and formed cylindrical contact sockets are integral with a metallic bus strip and extend away from corresponding circular openings within the bus strip with a leading edge spaced from a drawn lip defining the circular openings. Each socket is connected to the strip by a connecting strap extending from one side of the socket to a side edge of the strip and an integral supporting leg extends from the leading edge of each socket on the side opposite the connecting strap toward the respective openings. A terminal pin retention spring surrounding each socket prevents removal of an inserted contact terminal pin and the removal force is transmitted directly from the socket body through the leg to the bus strip to resist socket deformation.

3,732,523

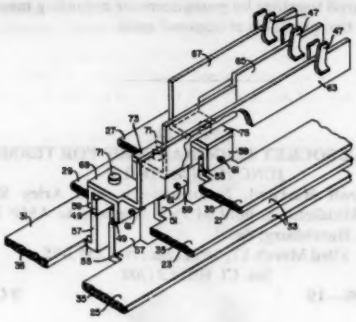
BUS DUCT SYSTEM INCLUDING IMPROVED PLUG-IN POWER TAKE-OFF MEANS

Samuel S. Fouse, and James R. Kotala, both of Aliquippa, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1971, Ser. No. 188,076
Int. Cl. H01r 13/60
U.S. Cl. 339—22 B 9 Claims

A unitary section of bus duct with plug-in power take-off outlets in which there are a set of a plurality of elongated unitary bus bars having a pair of opposite wide faces and a pair of opposite narrow faces, the bus bars being disposed in an elongated housing in which there are spaced openings in the housing sides facing the wide faces of the bus bars, which openings

are adapted for use with an adapter and a plug-in element, and



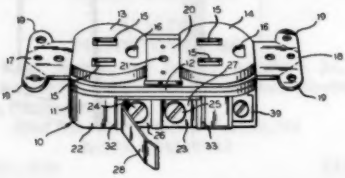
conductor means leading from each bus bar to a corresponding plug-in element in the openings.

3,732,524

ELECTRICAL RECEPTACLE WITH SAFETY COVER

Alan B. Reed, Oak Park, and George R. Eckart, Lake Zurich, both of Ill., assignors to Daniel Woodhead, Inc., Northbrook, Ill.

Filed Nov. 25, 1970, Ser. No. 92,813
Int. Cl. H01r *13/44*
U.S. Cl. 339—44 R **2 Claims**



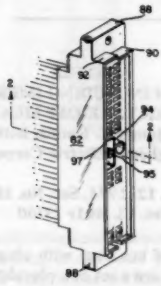
Electrical receptacle having terminal posts in a recess in the side of the receptacle body, and a hinged or removable safety cover for said recess extending across the terminal posts.

3,732,525

ELECTRICAL CONTACT TERMINAL AND CONNECTOR

Homer Ernst Henschen, Carlisle, and Clyde Thomas Carter, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed March 26, 1971, Ser. No. 128,439
Int. Cl. H01r *9/08, 13/58, 25/00*
U.S. Cl. 339—49 R **5 Claims**



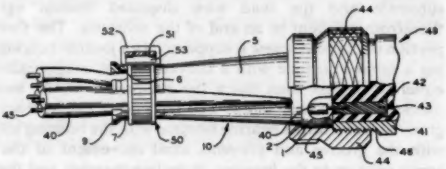
Hermaphroditic electrical terminal comprises web having sidewalls extending from the longitudinal edges thereof. Means extend from one end of the web for securing the terminal to a conductor and contact springs are provided at the other end of the terminal. These contact springs comprise planar extensions of the sidewalls which project forwardly and are reversely bent inwardly and towards the rearward end of the terminal in converging relationship to the axis thereof. Two electrical terminals of this type can be mated with each other by positioning them in opposed inverted relationship and moving them together so that one contact spring and one sidewall of each terminal are received between the contact springs of the other terminal. Terminals disclosed can also receive other electrical contact terminals of types that are commonly used on the present day computer and peripheral computer equipment. A connector housing is also disclosed having cavities which are adapted to receive electrical terminals in accordance with the invention.

3,732,526

ELECTRICAL CONNECTOR WITH IMPROVED CABLE SUPPORT

Stephen Punako, Bainbridge, N.Y., assignor to The Bendix Corporation

Filed June 25, 1971, Ser. No. 156,638
Int. Cl. H01r *13/58*
U.S. Cl. 339—101 **16 Claims**



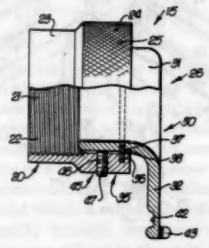
A plastic conduit affixed to and extending from the end of an electrical connector to prevent radial, axial and rotational forces acting on the electrical wires leading to the connector from reaching the connection of the connector contacts and electrical wires. The plastic cable support includes a plurality of axial slots that permit the cable support to be compressed into the wires passing through the conduit and at least one radial shoulder on the inside of the compressible portion so that the wires may be retained in a fixed position. The plastic cable support prevents radial, axial and rotational forces from reaching the connection of the wires to the contacts.

3,732,527

STRAIN RELIEF CLAMP

Thomas L. McKnight, Lake San Marcos, Calif.

Continuation-in-part of Ser. No. 859,923, Sept. 22, 1969, abandoned. This application May 4, 1971, Ser. No. 140,091
Int. Cl. H01r *13/58*
U.S. Cl. 339—103 M **5 Claims**



A strain relief clamp for a wire bundle which may be disposed at an angle to the axis of a mating connector including a cylindrical collar for connection to the mating connec-

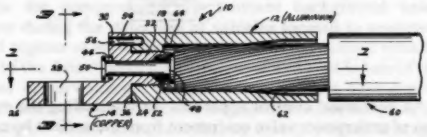
tor, a wire guide having a tubular portion located concentrically within the cylindrical collar and secured to the collar by a snap ring within aligned circumferential grooves in each, and an arm portion joined to the tubular portion and extending outwardly at an angle to the axis of the guide, the wire guide being rotatable to a position where the arm portion is aligned with the wire bundle prior to or after the collar has been loosely connected to the mating connector whereupon the guide may be non-rotatably locked relative to the mating connector and a bundle binder attaches the wire bundle to the arm portion.

3,732,528

BI-METAL TERMINAL LUG

Ottomar H. Vetter, Minneapolis, Minn., assignor to United Carr Incorporated, Boston, Mass.

Filed Dec. 9, 1970, Ser. No. 96,414
Int. Cl. H01r *11/08, 11/12*
U.S. Cl. 339—113 R **7 Claims**



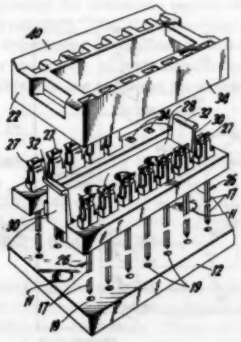
An aluminum barrel member has an opening at one end into which the bared end of an aluminum cable is inserted. Threaded into the other end of the barrel member is the shank of a copper tongue member having a flat portion circumjacent thereto which provides a relatively broad surface contact with the barrel member. A spring-biased indicator plug extends through the shank and is pushed outwardly when the cable end has been fully inserted. After insertion, the barrel member is crimped tightly against the cable.

3,732,529

INTEGRATED CIRCUIT SOCKET

Lawrence P. Weisenburger, Ottsville, Pa., assignor to Aries Electronics Inc., Frenchtown, N.J.

Filed Dec. 22, 1970, Ser. No. 100,743
Int. Cl. H01r *23/02, 13/12*
U.S. Cl. 339—192 R **15 Claims**



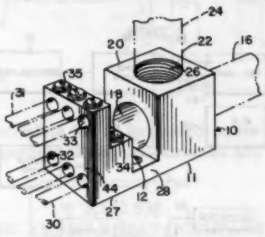
A socket assembly for receiving electronic components and comprised of a base having channels therethrough receiving a terminal comprised of an upper receptacle and a terminal post extending through the channels and from beneath the base, and of an upper housing mating with the base and including channels receiving the receptacles of the electrical terminals and terminating in openings at the top of the housing for accepting the pins of the electronic component. The housing is removable for the easy replacement of the terminals and is held in place by laterally deflectable interior arms on the base having hook portions engaging a shoulder in the housing.

3,732,530

CONNECTOR FOR HIGH AMPERAGE APPLICATIONS

Richard L. Linn, Northbrook, and Gerald J. Shea, Buffalo Grove, both of Ill., assignors to Underwriters Safety Device Company, Chicago, Ill.

Filed Jan. 31, 1972, Ser. No. 221,918
Int. Cl. H01r *9/00*
U.S. Cl. 339—198 N **9 Claims**



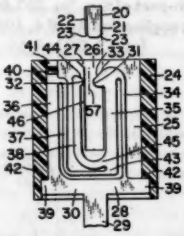
A unitary connector particularly suitable for high amperage applications is disclosed. It provides a high density of smaller conductor connections per length of connector. In spite of the high density, the connection of any one conductor can be adjusted without disturbing the connection of any other conductor. The connector greatly facilitates visual inspection of all connections for confirmation of the completeness and security of each connection. The connector body can be made from metal extrudate, and current passing through the integral connector does so without passing across butting interfaces between elements within the connector assembly.

3,732,531

ELECTRIC CONTACTS

Jean Claude Bouley, Jura, France, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 16, 1971, Ser. No. 153,574
Int. Cl. H01r *9/08*
U.S. Cl. 339—217 R **7 Claims**



This invention is an electrical connector for receiving and contacting a mating electrical connector such as a printed circuit board. The connector has a contact element including a terminal portion which is kept in a rigid, well-defined position and a contact portion which is moveable in order to provide proper contact with the mating electrical connector. The connector has a body of insulating material having an opening for the mating electrical connector and has a slot intersecting the opening with the contact element disposed therein. The contact element has a positioning portion which is engageable with the mating electrical connector for automatically positioning the contact portion of the contact element against the contact surface of the mating electrical connector. In one embodiment of the invention, the contact element can be held in

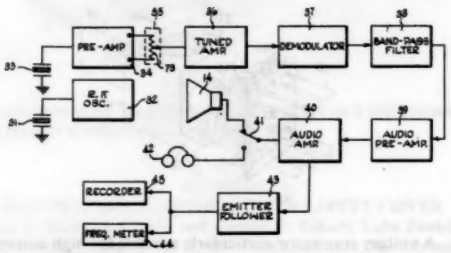
one of two different positions for making contact with the mating connector in one of two different positions.

3,732,532

ULTRASONIC DOPPLER INSTRUMENT

John J. Flaherty, Elk Groove Village, and Richard M. Soble, both of Chicago, Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Continuation of Ser. No. 658,117, Aug. 3, 1967, abandoned. This application March 19, 1971, Ser. No. 126,336
Int. Cl. A61b 5/02; G01s 9/66
U.S. Cl. 340—1 R 14 Claims



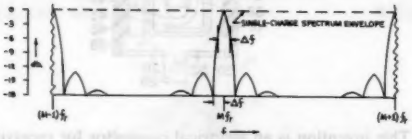
Medical ultrasonic doppler instrument in which transmitting and receiving transducers are mounted within a hollow casing on wave-transmission means of solid material cemented within one end of the casing and having planar surface means, preferably at an angle, to engage the skin of a living body being tested. Important features relate to the provision of wave absorpent material between the case and the wave-transmission means, the provision of a barrier between separate solid members to form the wave-transmission means, and the use of a biased amplifier-detector or a product detector.

3,732,533

UNDERWATER EXPLOSIVE-ACOUSTIC TRANSDUCER AND SYSTEMS

David Epstein, and Sidney Epstein, both of Brooklyn, N.Y., assignors to Vadys Associates, Ltd., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 367,607, May 12, 1964, abandoned. This application April 4, 1966, Ser. No. 541,918
Int. Cl. G01s 9/66
U.S. Cl. 340—3 7 Claims



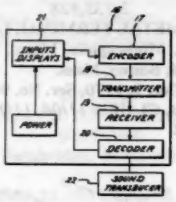
An underwater sonic detection system wherein underwater pulses are generated in uniformly spaced selected time sequence to produce a water traversable multi-line spectrum made up of a plurality of discrete reflectable narrow band consecutively sequenced harmonic sonic frequencies of substantially uniform energy content and receiver means are employed to (a) discriminatorially sense reflections thereof from a target engaged thereby or (b) sense the relative radial velocity component of an engaged target in a transient type Doppler system or (c) sense emanated-vibratory frequency modes induced in a target engaged thereby.

3,732,534

ACOUSTICAL UNDERWATER CONTROL APPARATUS

Paul C. Koomey, Houston, Tex.; Alan J. Streb; George S. Stivers, both of Baltimore, Md., and Theodore R. Barker, III, Pasadena, Md., assignors to Global Marine, Inc., Los Angeles, Calif.

Division of Ser. No. 504,742, Oct. 24, 1965, Pat. No. 3,405,387. This application July 3, 1967, Ser. No. 650,814
Int. Cl. H04b 11/00
U.S. Cl. 340—5 R 16 Claims



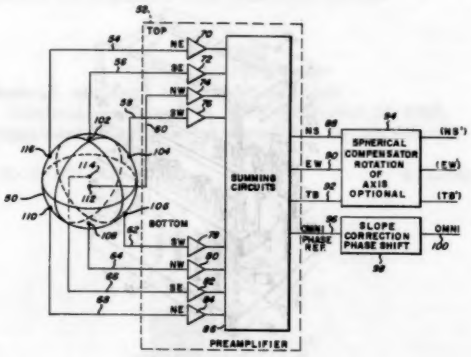
An acoustical control apparatus for controlling the operation of underwater valve equipment from the surface by coded acoustical signals and monitoring the status of the equipment by acoustical signals. A radioisotope thermoelectric generator positioned underwater continuously charging a battery which powers a pump for maintaining hydraulic pressure in an accumulator for actuating an underwater valve, all of which is controlled and monitored about the water surface by the use of coded acoustical signals.

3,732,535

SPHERICAL ACOUSTIC TRANSDUCER

Stanley L. Ehrlich, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 15, 1969, Ser. No. 850,478
Int. Cl. G01v 1/00
U.S. Cl. 340—10 17 Claims



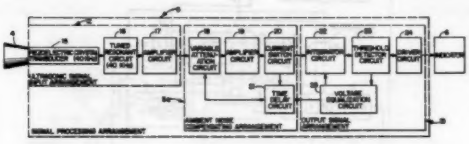
A spherical acoustic transducer formed from electromechanically active material and having a common electrode attached to one surface as a voltage reference and a distribution of electrodes attached to other surfaces so that the radial and circumferential vibrating modes of the acoustically excitable sphere are detectable and resolvable as to bearing angle over 4π steradians.

3,732,536

PASSIVE OBJECT DETECTION APPARATUS INCLUDING AMBIENT NOISE COMPENSATION

Vincent E. Larka, Burlington, and Larry Wilharm, Sandwich, both of Mass., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Sept. 18, 1970, Ser. No. 73,316
Int. Cl. H04b 1/00
U.S. Cl. 340—16 R 22 Claims



An ambient noise compensating arrangement for use in a passive ultrasonic vehicle detection apparatus carried by a vehicle for compensating for ambient background noise present during the detection of vehicles located in predetermined regions of surveillance rearward of the subject vehicle. Prior to the detection of the presence of a vehicle in one of the regions of surveillance, the prevailing ambient background noise is sensed by a signal-receiving horn member mounted on the subject vehicle and processed by an input signal arrangement coupled to the horn member to produce a noise voltage signal representative of the ambient background noise. The noise voltage signal is applied to a field effect transistor the resistance of which is increased in response to the noise voltage signal by an amount sufficient to essentially fully attenuate the noise voltage signal.

When a vehicle subsequently enters the region of surveillance rearward of the subject vehicle, after the aforementioned ambient noise compensation, various signals including ultrasonic signals generated inherently by the vehicle, due to a combination of factors such as engine and body vibrations, and engine and tire noises, are received by the signal-receiving horn member and applied to a piezoelectric crystal transducer provided in the input signal arrangement. The piezoelectric transducer has a predetermined resonant frequency equal to the frequency of particular ultrasonic signals generated inherently by all existing engine-driven road vehicles. The piezoelectric transducer operates in response to the various signals received from the horn member to produce an output voltage which is greatest for ultrasonic signals of the predetermined resonant frequency. The output voltage produced by the piezoelectric transducer is then processed to provide an indication to the operator of the subject vehicle of the presence of the vehicle in the region of surveillance.

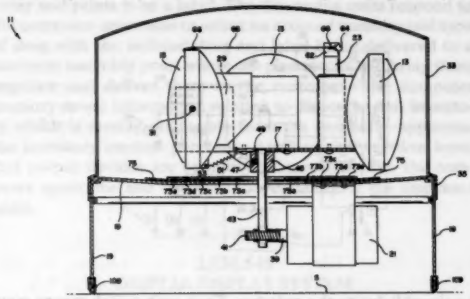
3,732,537

ROTATING WARNING LIGHT WITH AN INTEGRATED SPOTLIGHT

William D. Freeman, 3640 Overton Crossing, Memphis, Tenn.

Filed May 7, 1971, Ser. No. 141,262
Int. Cl. B60q 1/52; F21m 3/00
U.S. Cl. 340—50 13 Claims

A rotating warning light intended to be mounted on the roof of a vehicle which includes four rotating lightbulbs facing outwardly in four different directions. Three of the lightbulbs have colored lenses, e. g., red or blue, and the remaining lightbulb has a clear lens defining a spotlight under certain conditions. The device includes structure for (1) remotely moving the spotlight about a horizontal axis so the beam therefrom may be lowered or raised; (2) continuous operation of the four lightbulbs simultaneously while they rotate, thus providing a highly conspicuous wig-wag effect; (3) selectively reversing the direction of rotation of the platform supporting the four lightbulbs, thus facilitating optimum maneuverability of the spotlight; (4) continuous operation of the spotlight while simultaneously flashing the colored lights, thus providing a warning signal while utilizing the spotlight feature; (5) continuous operation of the spotlight while the colored lights



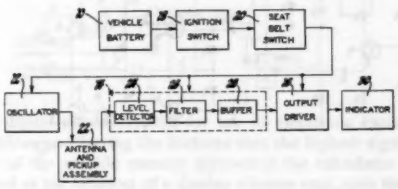
are off, thus providing for an improved power-assist highly maneuverable spotlight having unobstructed 360° utilization.

3,732,538

ELECTRONIC VEHICLE SEAT OCCUPANT SENSOR

Arden G. Gillund, Oak Creek, and John A. Moretti, Greendale, both of Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1972, Ser. No. 228,544
Int. Cl. G08b 21/00
U.S. Cl. 340—52 E 3 Claims



An electrical antenna system including first and second elements is embedded in the seat of a vehicle with the first element being coupled to the output of a controlled AC source which supplies thereto a controlled alternating signal. The second element of the antenna system is connected to the input of a high impedance dectector. A wire mesh capacitively coupled the two elements and the signal coupled from the first element to the second element is detected by the detector. When a human is in proximity to the wire mesh, the capacitance characteristic of the human capacitively loads the antenna to the vehicle chassis which decreases the signal input to the detector. An indicator is responsive to the output of the detector to provide an indication when the signal input to the detector decreases due to the presence of the human in the proximity of the wire mesh to indicate the presence thereof. Distributed multiple wire antennas with and without conductive wire mesh and single wire antenna systems are described.

3,732,539

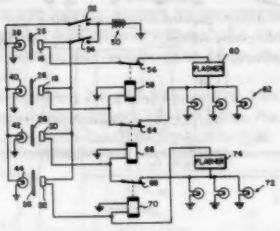
SAFETY LIGHT SYSTEM FOR TRUCKS

Herbert D. Easterly, 2515 Cliffbourne St. N.W., Apt. 5, Washington, D.C.

Filed May 19, 1971, Ser. No. 144,781
Int. Cl. B60q 1/54
U.S. Cl. 340—62 5 Claims

A speed signal system for a vehicle and particularly for a truck comprising a speedometer mechanism including the usual movable indicator mounted and arranged to move along a path to provide a visual indication of the speed at which the vehicle is traveling, a plurality of switches disposed in spaced apart relationship along the path to provide electrical outputs

representing the speed of such a vehicle, and an actuator for the switches movable along with the said indicator. A plurality of signal lights are provided and circuits operatively connect



the signal lights to the switches. Four such switch means may be used to indicate very low speed, low to intermediate speed, normal operating speed, and excessive speed, respectively.

3,732,540

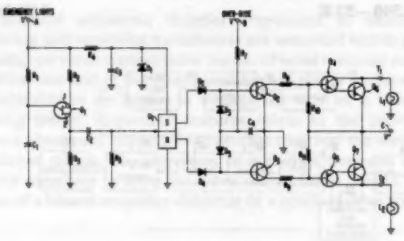
EMERGENCY WARNING LIGHT SWITCHING SYSTEM

Robert F. Platte, 810 Kay Court, Laurel, Md.

Filed Nov. 16, 1970, Ser. No. 89,562

Int. Cl. B60q *1/46*

U.S. Cl. 340—76 **10 Claims**



An emergency warning light switching system for motor vehicles employs a solid state oscillator circuit which controls the alternate energization of vehicle lamps, such as, the vehicle headlamps. A unijunction transistor oscillator-bistable multivibrator arrangement supplies alternate pulses to a gate network. The pulses are amplified and alternately supplied to the vehicle lamps. An oscillator over-ride arrangement is provided, whereby the vehicle lamps may be energized simultaneously.

3,732,541

METHOD AND APPARATUS FOR EVALUATING REPETITIVELY TRANSMITTED SIGNALS

Gunter Neubauer, Konstanz, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

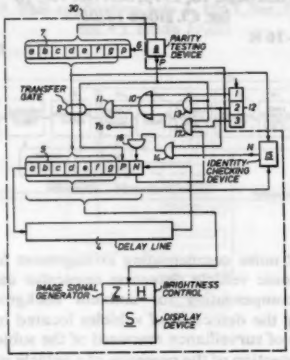
Filed April 26, 1971, Ser. No. 137,144

Claims priority, application Germany, April 27, 1970, P 20 20 413.1; Oct. 22, 1970, P 20 51 848.3

Int. Cl. G06f *11/00;* **G08c** *25/00*

U.S. Cl. 340—146.1 BA **8 Claims**

A method and apparatus for correcting or at least detecting, at a receiver, errors in a sequence of data words each sent together with an associated parity test signal over a transmission channel between a transmitter and the receiver, the error correction or at least detection being performed by subjecting each received word to a parity test and delivering the received words, together with a signal indicating the result of their individual parity tests, into a memory, sending the words and their associated parity test signals a second time over the transmission channel, subjecting the words received during the second transmission to a parity test and comparing each word with the word received during the first transmission, replacing, in the memory, a word received during the first transmission by the word received during the second transmission only when the word received during the second transmission does not have a parity error, causing the words to be sent



over the transmission channel a third time, subjecting the words received during the third transmission to a parity test, and replacing a word then in the memory with the word received during the third transmission only when the versions received during the first and second transmissions differed from one another and the word received during the third transmission has correct parity.

3,732,542

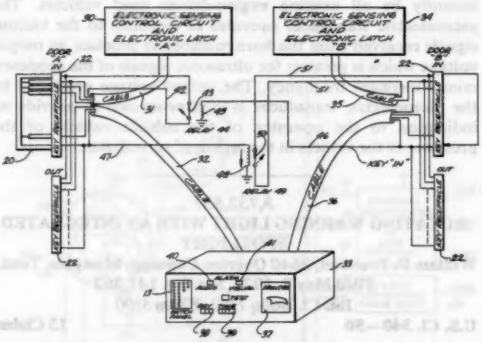
ELECTRONIC IDENTIFICATION KEY ACTUATED CONTROL SYSTEM

Robert A. Hedin, San Pedro, Calif., assignor to R. B. Phinizy, Anaheim, Calif.

Filed May 6, 1970, Ser. No. 35,061

Int. Cl. H04q *3/00*

U.S. Cl. 340—149 A **8 Claims**

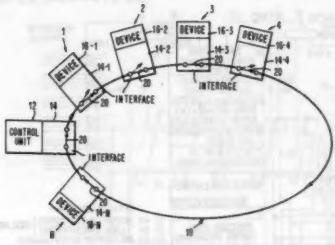

ELECTRONIC SENSING CONTROL CIRCUIT AND ELECTRONIC LATCH "A"
ELECTRONIC SENSING CONTROL CIRCUIT AND ELECTRONIC LATCH "B"
CABLE
RELAY
KEY "IN"

An electrical control system includes a controlled device, a key for generating electrical signals representative of actuating and identification information, means for selecting identification information desired to be voided and means responsive to the generation of voided identification information to prevent operation of the controlled device. Sensing means are provided for sensing the actuating information and providing an output control signal for actuating the controlled device, and gating means gates voided identification information to the means responsive to the generation of the voided signals to prevent the sensing means from actuating the controlled device.

3,732,543
LOOP SWITCHING TELEPROCESSING METHOD AND SYSTEM USING SWITCHING INTERFACE

Edouard Y. Rocher, Ossining, and Stanley E. Schuster, Granite Springs, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,320
Int. Cl. H04j *5/00*; G06f *9/00*
U.S. Cl. 340—172.5 **4 Claims**

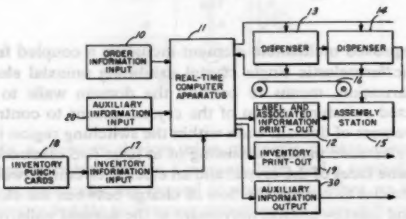


A method and system is described for handling digital information in the form of addressed messages. The system includes a master communication loop such as a transmission cable. A plurality of sub-loops as well as devices are connected to the master loop through suitable interface units and sub-loop control units. In each of the sub-loops a plurality of devices capable of transmitting and receiving digitally coded messages are connected to the sub-loops through interface units. Two special characters precede the message and permits a sub-loop control unit to take control of the loop to transmit messages and to obtain further messages from the devices in the associated sub-loop. When a unit is permitted to transmit, it produces and transmits a third special character which is received by the other interfaces or stations which are ready to transmit and informs the other interfaces that they may not transmit. After an interface transmits its message or messages, it produces the first and second special characters which is received by the next interface in the loop that is ready to transmit and in this manner, the sequence of transmission is passed around the loop under the control of the interfaces in the loop.

3,732,544
COMPUTER-CONTROLLED ARTICLE MERCHANDISING SYSTEM FOR PRESCRIPTION DRUGS AND LIKE ARTICLES

Donald R. Obland, 2940 So. Glencoe, Denver, Colo.

Filed Nov. 25, 1970, Ser. No. 92,550
Int. Cl. G06f *9/00*; G05b *15/00*
U.S. Cl. 340—172.5 **12 Claims**

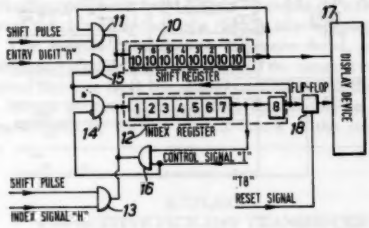


An automatic merchandising system for prepackaged articles such as prescription drugs. The drugs are stored in individual prepackaged units on a continuous strip which is wound on a reel in an individual dispenser unit for each type of drug. An information input device, preferably a typewriter input apparatus, receives the order information and converts the information to computer language signals. A real-time central computer control apparatus stores the information and a print-out device reads the order information from the computer and prints it on a label. The dispensing units respond to the computer apparatus to select an ordered quantity and type of drug with the ordered drug and label being delivered to a common assembly point where the pharmacist will bring them together and deliver them to the customer. The computer memory stores information relating to dispenser unit inventory which is readily obtainable from the computer apparatus for inventory control purposes. Auxiliary information input and output devices are operatively associated with the computer apparatus and operate independently of the dispenser units.

3,732,545
DIGITAL DISPLAY SYSTEM

Isao Hatano; Akira Nagano, and Kiyoshi Koya, Kyoto-fu, Japan, assignors to Omron Tateisi Electronics Co., Kyoto-shi, Kyoto-fu, Japan

Filed Dec. 24, 1970, Ser. No. 101,276
Claims priority, application Japan, Dec. 26, 1969, 44/1045
Int. Cl. G06f *3/14*; G06k *15/18*
U.S. Cl. 340—172.5 **2 Claims**

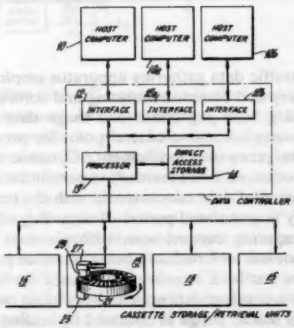


A digital display system for use in electronic calculating machines and having the features that the highest significant digit of the specific number entered in the calculator is displayed at the leftmost of a display window unit, with the least significant digit at the rightmost side and that unnecessary "0" figures other than those included in the specific number are erased.

3,732,546
INFORMATION STORAGE AND RETRIEVAL SYSTEM

David G. Ronkin, 15-70 208th Street, Bayside, N.Y., and David J. Schwartz, 8 Colgate Road, Greenlawn, N.Y.

Filed Feb. 4, 1971, Ser. No. 112,542
Int. Cl. G06f *13/08*
U.S. Cl. 340—172.5 **33 Claims**



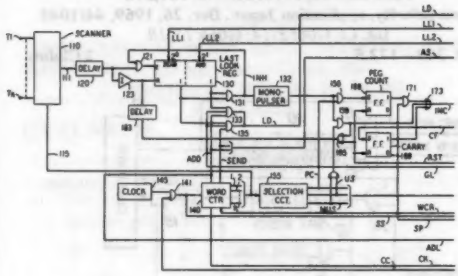
Disclosed is a high capacity, random access, alterable magnetic memory system employing sets of rotatable annular ar-

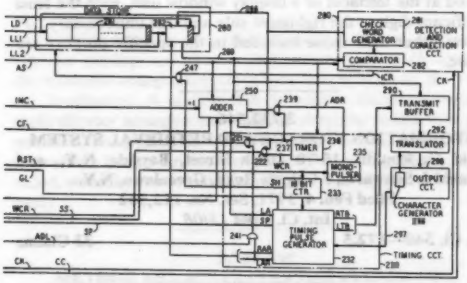
rays of multi-track tape cassettes serving as the storage media. Under control of a data controller, containing a small programmable computer and direct access storage disc or drum, the cassette arrays are each rotated to bring addressed cassettes into engaging relationship with respective tape transports which receive the requisitioned cassette, position a read/write, write/read head assembly in registration with the addressed track, and drive the tape. An interface system in the controller couples the memory system to one or more host computers of the user for reading data from or writing data on the tape, without the need to stop the tape at the addressed data block site.

3,732,547
TRAFFIC DATA GATHERING APPARATUS

Richard Henry Etra, New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 28, 1971, Ser. No. 157,410
Int. Cl. G06f *3/04*
U.S. Cl. 340—172.5 **11 Claims**



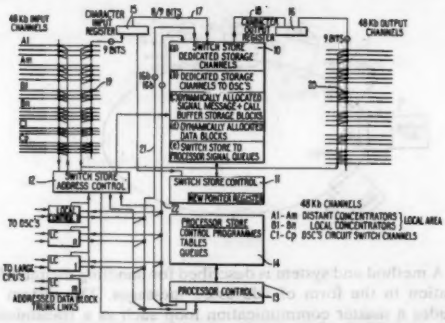


A portable traffic data gathering apparatus employs a recirculating memory and common scanning and control circuitry for accumulating both peg count and usage data in a form suitable for transmission to a central point for processing by electronic data processing equipment. Dynamic and static storage are interleaved in the memory to permit the accumulation of one period of data concurrently with the transmission of a previously accumulated period of data. Peg count is obtained by comparing current scan with previous scan, the previous scan or last look memory being stored as part of each data word. The last look memory is also used for input noise filtering, three successive data appearances being required before a count is made. Usage is obtained by scaling down the peg count scans using part of the dynamic and static data words. Detection and correction circuitry minimizes problems due to recirculating memory shifting malfunction.

3,732,548
SWITCHING CENTER FOR A DATA NETWORK

George Aneurin Howells, Bishop's Stortford, and Elisabeth June Hunt, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 19, 1971, Ser. No. 17,333
Claims priority, application Great Britain, Aug. 20, 1970, 40,097/70
Int. Cl. H04q *11/00*
U.S. Cl. 340—172.5 **11 Claims**

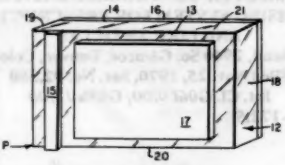


A switching center for a data network in which dedicated storage is provided for channels in each direction the channels handling a mixture of circuit switched (end-to-end connections) and packet switched (store and forward) messages. The switching center interconnects with other centers and with local area channels which may or may not have been concentrated.

3,732,549
PROCESS AND APPARATUS FOR CONTROL OF DOMAIN WALLS IN THE FERROELASTIC-FERROELECTRIC CRYSTALS

John R. Barkely, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 112,733, Feb. 4, 1971, abandoned. This application May 8, 1972, Ser. No. 251,055
Int. Cl. G11c *11/22*
U.S. Cl. 340—173.2 **34 Claims**



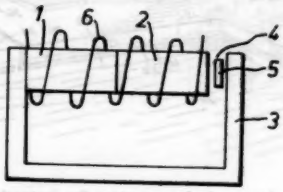
An improved multistable element including a coupled ferroelectric/ferroelastic single crystal exhibiting uniaxial electric polarization, means to confine the domain walls to a preselected switching region of the crystal, means to control the movement of domain walls within the switching region including electrode means consisting of at least two electrodes on opposite faces of the crystal and an electric circuit between the electrodes to control the flow of charge between the electrodes and thereby control movement of the domain walls, optionally cooperating with means to apply mechanical stress to the crystal to move the domain walls, means to inhibit the nucleation of spurious domain walls within the crystal, and optionally means for the controlled nucleation of domain walls in the switching region. In combination with means for detecting the position of the domain wall the multistable element provides a multistable information processing apparatus and process.

3,732,550

BISTABLE STORAGE ELEMENT WITH MAGNETIC DATA STORAGE

Walter Haupt, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 23, 1970, Ser. No. 100,885
Claims priority, application Germany, Jan. 23, 1970, P 20 02 936.1
Int. Cl. G11c 11/04
U.S. Cl. 340—174 ZB 9 Claims



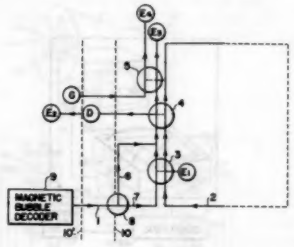
A bistable storage element with magnetic data storage contains in its magnetic circuit magnetized cores with different coercivities H_1 and H_2 so that only one core can be remagnetized by an external magnetic field H of the value $H_2<H<H_1$. An air gap is provided in the magnetic circuit within a magnetically controllable semiconductor component.

3,732,551

MAGNETIC SINGLE WALL DOMAIN MEMORY

Noriyuki Homma, Kokubunji; Yoshihiko Noro, Yokohama, and Shigeru Yoshizawa, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1972, Ser. No. 229,090
Claims priority, application Japan, Feb. 24, 1971, 46/9192
Int. Cl. G11c 11/14, 19/00
U.S. Cl. 340—174 TF 8 Claims



In a memory device using magnetic bubble elements, a memory bubble within a memory loop and a control bubble from a decoder are caused to repel each other, to lead the memory bubble to an erase circuit and to erase it therein, and thereafter, the repelled control bubble and an information bubble are further caused to repel each other, to feed either of the bubbles into the memory loop and to thus effect write-in of the information.

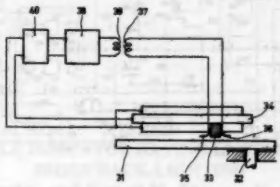
Read-out of information is carried out such that a memory bubble within a memory loop and the control bubble are caused to repel each other, to detect either of the repelled bubbles by means of a detector.

3,732,552

FLOATING MAGNETIC HEAD SYSTEM WITH VARIABLE CURVATURE SHOE

Anthonie Walraven, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,419
Claims priority, application Netherlands, Aug. 29, 1970, 7012826
Int. Cl. G11b 5/60
U.S. Cl. 340—174.1 E 6 Claims



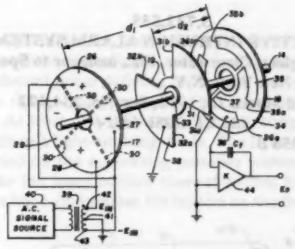
A floating magnetic head system operable on a fluid medium over the record surface of a rapidly moving magnetic carrier. The system comprises a magnetic head, a support member, and a biasing element to hold the support member at a desired distance from the record carrier against the medium flow. Means are provided to change the floating height of the magnetic head by varying the curvature of the support surface.

3,732,553

CAPACITIVE PICK-OFF TRANSDUCER

Edward V. Hardway, Jr., Houston, Tex., assignor to Spearhead, Inc., Houston, Tex.

Filed April 16, 1971, Ser. No. 134,818
Int. Cl. G08c 19/10
U.S. Cl. 340—200 17 Claims



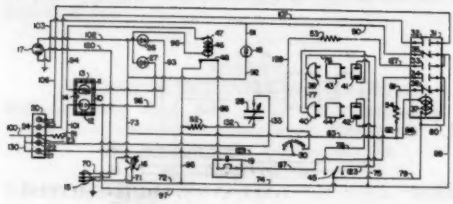
A capacitive pick-off transducer is disclosed in which small relative movement between aligned capacitive elements is utilized to provide an electrical output signal responsive to such movement. The capacitive elements include a fixed driven element having 2^n driven sectors each connected to one of two sources of input electrical signals of opposite phase, a fixed receptor element including 2^{n-1} active areas connected to an electrical signal output circuit, and a moveable shield element between the driven and receptor elements and including 2^{n-1} shielding lobes. Circuit means including a high gain amplifier with a negative feedback circuit are provided for maintaining the signal levels of the shield element and the active areas substantially lower than the absolute values (ignoring polarity) of the input signals, and preferably at or near ground.

3,732,554

ALARM UNIT

John A. Ginard, 3064 Albany Crescent, Bronx, N.Y.

Continuation-in-part of Ser. No. 872,666, Oct. 30, 1969, abandoned. This application May 19, 1971, Ser. No. 145,072
Int. Cl. G08b 13/26
U.S. Cl. 340—258 C 8 Claims



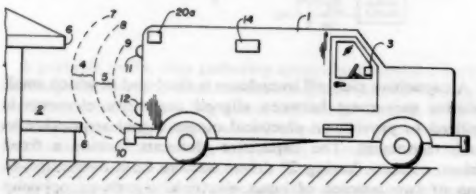
An electrically operated unit may be used as a switch in a wide variety of alarm, detection and like systems. The central element of the unit is a neon glow lamp connected between a hot line lead of an alternating current source and a potential load lead, the potential load lead being connected to a sensitivity lead. On the application of an external capacitance to the sensitivity lead capacitive reactance decreases to more brightly light the lamp to activate a photoconductive cell to operate the switch function of the unit. A potentiometer and a variable capacitor are connected between the hot line lead and the potential load lead so as to form a parallel circuit with the lamp with reference to the external capacitance applied to the sensitivity lead. The potentiometer and the variable capacitor regulate the brightness of the lamp and thereby the threshold of activation and the sensitivity of the unit. Other elements in the circuitry of the unit test its function and enable it to reset itself.

3,732,555

SELECTIVE INTRUSION ALARM SYSTEM

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed March 13, 1972, Ser. No. 234,172
Int. Cl. G08b 13/24
U.S. Cl. 340—258 B 8 Claims



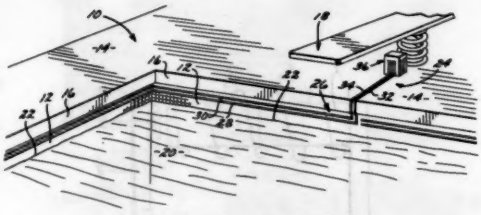
A radio object detection, communication, and alarm system for aiding in maneuvering a truck for the delivery of goods at an unloading platform and for protecting the open truck from unauthorized entry during unloading includes portable radio communication means for inhibiting alarm operation when authorized personnel are present in a protected zone.

3,732,556

SWIMMING POOL ALARM SYSTEM

Nelson P. Caprillo, 14170 Remington Street, Arleta, Calif.; David Snyder, 22530 Schoolcraft Street, Canoga Park, Calif., and JOhn P. Husko, 18433 Collins Street, Tarzana, Calif.

Filed June 25, 1971, Ser. No. 156,670
Int. Cl. G08b 13/16
U.S. Cl. 340—261 14 Claims



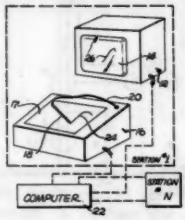
A swimming pool alarm system for instantly providing an audible or other alarm in response to a person or other object falling into the water. According to the invention, the alarm is adapted to be energized and held in the energized state by electronic switching means that switches from its "off" to its "on" condition in response to a trigger pulse from normally open sensor conductor means which is closable by a momentary splash of water thereon. Such sensor conductor means substantially completely circumscribes the pool closely spaced above the normal water level thereof, whereby the splash or wave motion from an object falling into the pool any place about the periphery thereof will momentarily close the sensor conductor means and thereby turn the switching circuit means "on" to actuate the alarm.

3,732,557

INCREMENTAL POSITION-INDICATING SYSTEM

David C. Evans, and Ivan E. Sutherland, both of Salt Lake City, Utah, assignors to Evans & Sutherland Computer Corporation, Salt Lake City, Utah

Filed May 3, 1971, Ser. No. 139,434
Int. Cl. G08b 5/36
U.S. Cl. 340—324 R 9 Claims



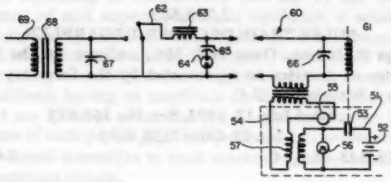
A system for digitally manifesting the position of a probe with reference to aligned sets of conductors. Orthogonally arranged sets of index conductors in a tablet, and circular structures with parallel sets of conductors are shown for shaft-position encoder applications. Individual conductors in space-related, aligned, repeating sets are separately energized by phase-displaced signals which are proximity sensed to provide a phase-modulated signal that is digitally detected to manifest relative displacement. Incremental information may be supplemented by absolute position information, and the representative phase-modulated signals may be transmitted over long-distance communication links.

3,732,558

HIGHWAY SIGN SYSTEM

James Robert Justice, Roanoke, Va., assignor to The Headway Company, Roanoke, Va.

Filed Feb. 9, 1971, Ser. No. 114,011
Int. Cl. G09f 13/04
U.S. Cl. 340—330 13 Claims



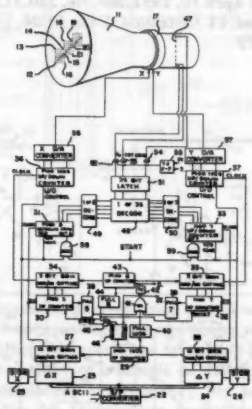
A remotely controlled sign system for informing motorists of limited access highways of the facilities available at each exit. The system has a signboard with a plurality of individually lit panels, each advertising a different facility. Each panel is operated by a remotely controlled circuit which also informs the facility operator whether the panel is lit or unlit.

3,732,559

SEGMENTED BINARY RATE MULTIPLE-BEAM DISPLAY SYSTEM

William Ernest Eichelberger, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed June 7, 1971, Ser. No. 150,636
Int. Cl. G06f 3/14
U.S. Cl. 340—324 AD 5 Claims



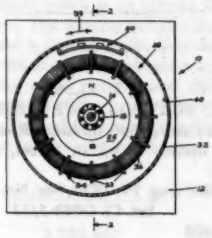
A character generator system produces a visual vector display in response to digital vector commands. A plurality of cathode ray beams impinge upon the display screen in a matrix array. The control grid has separate control elements which selectively control the intensity of each of the beams. The deflection system positions the matrix array of cathode ray beams to different locations on the display screen. A segmented binary rate multiplier responds to the digital vector commands to produce intensity control signals which are applied to the control elements to selectively intensify the cathode ray beams to produce a vector segment having a starting point and a terminating point and which extends across the matrix array. The binary rate multiplier also produces deflection signals which position the array so that the starting point of the vector segment across a new array coincides with the terminating point on the previous array.

3,732,560

ROTATABLE INDICATOR HAVING LIGHT-EMITTING DIODE BACK-LIGHTING

Phillip L. Harden, and Samuel M. Thomas, Jr., both of Fort Wayne, Ind., assignors to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Dec. 11, 1970, Ser. No. 97,168
Int. Cl. G01d 11/28; H05b 33/00
U.S. Cl. 340—373 7 Claims



A rotatable indicator, such as a rotatable magnetic position indicating wheel, including a cylindrical drum having opaque and translucent areas defining indicia on the outer drum surface, the drum being rotatably mounted on a supporting member. At least one solid state light-emitting device is provided, such as a light-emitting diode. The light-emitting device is supported on the supporting member within the drum and exposed to the inner surface thereof so that light emitted by the device back-illuminates the indicia on the drum.

3,732,561

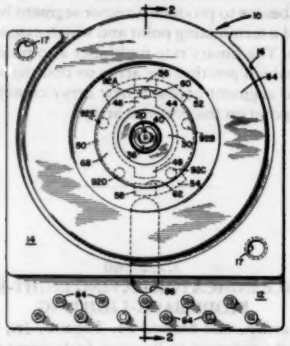
ELECTROMAGNETIC CONTROLLED WHEEL INDICATOR

Peter J. McGinnis, Chester Township, Delaware County, Pa., assignor to Litton Precision Products, Inc., Beverly Hills, Calif.

Filed Sept. 29, 1970, Ser. No. 76,494
Int. Cl. G08b 5/24
U.S. Cl. 340—378 R 9 Claims

An electromagnetic wheel indicator having an alphanumeric indicating wheel disposed about a rotor that is rotatably mounted within a stator. The stator is provided with inwardly directed radial stator poles wound with individual coils, each encompassing more than one stator pole. A permanent mag-

net forming part of the rotor is provided with two, opposite pole faces, the first of which is as wide as the width between



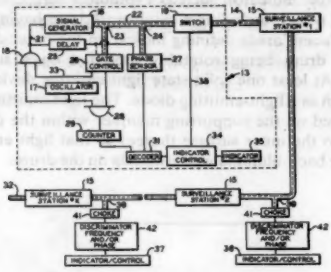
the more than one stator pole about which each coil is wrapped, while the second is at least one stator pole width narrower than the first.

3,732,562

SURVEILLANCE SYSTEM

Robert Charles Faber, 2549 Goddard Road, Toledo, Ohio, and Stephen B. Miller, 113-27th Street, Apt. B, Manhattan Beach, Calif.

Filed Aug. 19, 1970, Ser. No. 65,184
Int. Cl. G08b *5/22*
U.S. Cl. 340—408 **17 Claims**



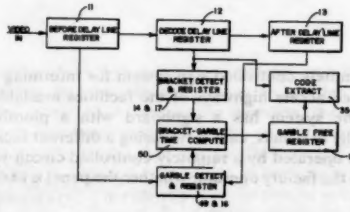
A surveillance system having a primary station from which signals are issued upon a coaxial cable to one or more surveillance stations. Each surveillance station selectively can impose an impedance discontinuity upon the cable which gives rise to a characteristic signal reflection and a measurable interval from the signal issuance to its reflected return to the primary station. This interval is indicative of the separation of the primary and surveillance stations. Various forms of surveillance station actuatory are contemplated for introducing the impedance discontinuities at the station in response to various actuating conditions. The system also locates breaks or other impedance discontinuities in the cable at other than surveillance stations. Where discontinuities are controllable, as by surveillance station means, they can be varied from time to time to convey supplemental information to the primary station and they can be imposed for brief intervals to enable the continued monitoring of other surveillance stations beyond the activated station during the periods that activated station is not imposing a discontinuity.

3,732,563

PULSE TRAIN DECODER-DEGARBLER

George P. Nelson, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 12, 1971, Ser. No. 161,672
Int. Cl. G01s *7/28, 9/56*
U.S. Cl. 343—6.5 LC **8 Claims**



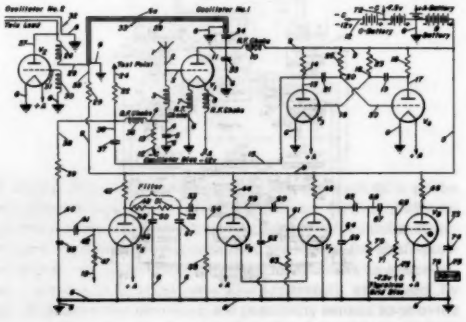
A decoder-degarbler for increasing the decoding efficiency of IFF decoders in the presence of garbled signals. Three delay lines and logic circuitry are utilized to detect the presence of a garble condition and bracket decode condition. A coincidence means then determines if an established decoding criteria has been met whereby there is a degarbled bracket decode output to permit decoding of the pulse train data input.

3,732,564

PULSE DOPPLER FUZE

John H. Kuck, and William M. McCord, both Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 10, 1951, Ser. No. 220,312
Int. Cl. G01s *9/04*; F42c *13/04*
U.S. Cl. 343—7 PF **4 Claims**



1. In a proximity fuze circuit, an antenna a normally ineffective superregenerative radio frequency oscillator coupled to

said antenna, said oscillator generating a radio signal to be radiated by said antenna and developing a detected output correlative to the difference between said generated signal and any reflected portion thereof intercepted by said antenna during the period of effectiveness of said oscillator, a multivibrator coupled to said oscillator for applying periodic impulses of a constant duration and repetition rate thereto thereby rendering said oscillator effective for a predetermined period after each of the applied impulses, a second radio frequency oscillator coupled to said superregenerative oscillator and operating at substantially one-half of the natural frequency of said superregenerative oscillator, a source of electricity energizing said superregenerative oscillator, said second oscillator, and said multivibrator, said second oscillator providing a second harmonic signal to said superregenerative oscillator having an amplitude level large relative to the level of any spurious noises thereby to effect constancy in the initiation of each period of effectiveness and to render said detected output insensitive to weak external signals, such as spurious jamming signals.

3,732,565

SPECTRUM ANALYSIS SYSTEMS USING OPTICAL CORRELATION TECHNIQUES PARTICULARLY USEFUL IN PULSE MODULATED DOPPLER RADAR SYSTEMS

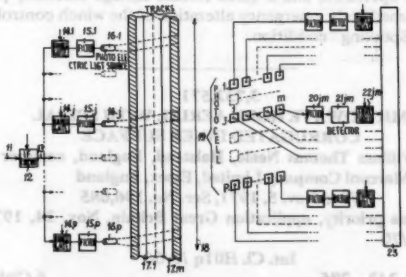
Leonides Symaniec; Christian Pepin, and Claude Skenderoff, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 23, 1971, Ser. No. 165,529

Claims priority, application France, July 23, 1970, 70,27248

Int. Cl. G01s 9/44

U.S. Cl. 343—9 **5 Claims**



System of spectrum analysis using optical correlation in real time with non-coherent light, comprising a moving plan with tracks, each track representing a frequency corresponding to the central frequency of a sample of the spectrum analyzed considered displaced in frequency by a predetermined frequency value ΔF. Transducer means convert the signal which frequencies are within the spectrum to be analyzed, into an optical modulated beam; photocell receivers in a correlation plane are followed by identical filters centered on ΔF and having a band corresponding to the width of a sample. The filter is followed by a detection circuit. The invention is particularly applicable to a pulse Doppler radar system.

3,732,566

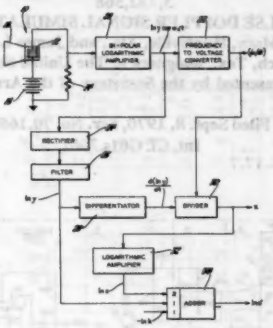
CONTINUOUS WAVE RANGING RADAR

Norman W. Schubring, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1971, Ser. No. 188,172

Int. Cl. G01s 9/50

U.S. Cl. 343—9 **3 Claims**



A continuous wave ranging radar system in which a transmitted constant amplitude continuous wave is combined with the reflected wave from an object to produce a waveform having a beat frequency equal to the Doppler difference frequency or the relative velocity between the radar system and the object and an amplitude which is an inverse function of the distance therebetween. The relative velocity is obtained from the beat frequency and is divided by the time derivative of the logarithm of the amplitude of the combined wave to obtain the distance between the radar system and the object. The logarithm of the amplitude of the combined wave is also combined with the logarithm of the distance between the radar system and the object to obtain the radar cross-sectional area of the object.

3,732,567

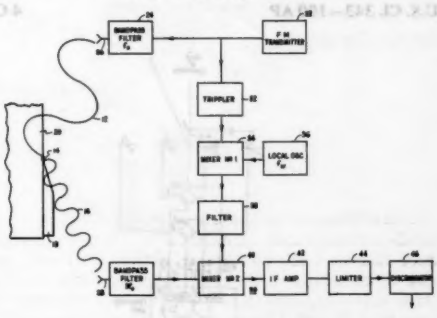
JUNCTION RANGE FINDER

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of; Sarto Morissette, Thetford Mines, Quebec, Canada; Ronald G. Sea, Newport Beach, Calif., and Marvin J. Frazier, Wood Dale, Ill.

Filed Sept. 21, 1970, Ser. No. 73,922

Int. Cl. G01s 9/23

U.S. Cl. 343—14 **2 Claims**



An apparatus for locating an electrically nonlinear object and determining the distance to the object by transmitting an

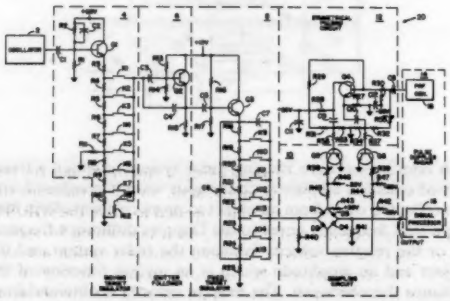
FM signal in the vicinity of the nonlinear object causing a signal of a higher harmonic to be reflected by the nonlinear object. A receiver is provided for receiving the higher harmonic reflected signal and comparing such with the initial exciting signal so as to produce a signal, the amplitude of which is directly proportional to the distance to the object.

3,732,568

PULSE DOPPLER SIGNAL SIMULATOR

Hollis W. O'Mary, Huntsville, Ala., and James L. Morris, Farmers Branch, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 8, 1970, Ser. No. 70,168
Int. Cl. G01s 7/40
U.S. Cl. 343—17.7 **7 Claims**



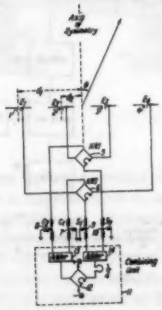
A device for providing signals which may be connected to the signal processing portion of a doppler radar to test the performance of the signal processor. The device may provide any preselected clutter level or target sizes. An audio signal is supplied to stage 1. The target size, a.c. signal level, is chosen by the appropriate set of relay contacts and is connected to stage 3 via a buffer stage 2. A preselected clutter level is supplied by stage 3. The continuous target size and clutter level outputs are converted to video pulses in coincidence with the input pulses from the pulse repetition frequency (PRF) generator of the doppler radar. The video pulses are supplied to the processor of the radar.

3,732,569

AERIAL FIELD SIMULATION

Robin Ashley Collins, Welwyn Garden City, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 21, 1971, Ser. No. 164,758
Int. Cl. G01f 7/40
U.S. Cl. 343—100 AP **4 Claims**



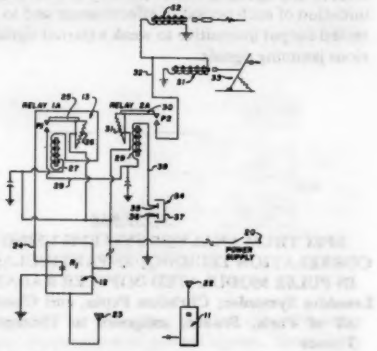
Any arbitrary antenna array distribution can be represented as the sum of a symmetric and an antisymmetric function. The radiation at any point in the far field of the aerial array can then be simulated by adding together the symmetric and antisymmetric outputs in quadrature with the correct amplitude. This simplifies the construction of subsequent combining units since these reproduce the far field at any point by amplitude wieghting along without the need for differential phasing.

3,732,570

REMOTE RADIO WINCH CONTROL UNIT

Antonio Francesco Fiorentino, 2373 Cranbrook Street, Cranbrook, British Columbia, Canada

Filed July 1, 1971, Ser. No. 158,835
Claims priority, application Canada, Jan. 8, 1971, 102214
Int. Cl. H04b 7/00; H04q 7/02
U.S. Cl. 343—225 **6 Claims**



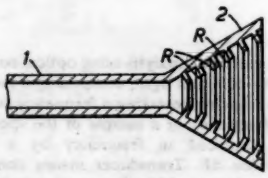
A remote control for winches having "Winch-In," "Free-Spooling" and "Brake-On" operating conditions includes a hand-held transmitter and a receiver on the winch. The receiver selectively operates "Winch-In" and "Free-Spooling" solenoid controls and an engine accelerator control on the winch engine. A "Manual-Remote" selector linkage assembly is provided to permit either manual control or remote control operation, and a quick-release linkage assembly permits immediately emergency alteration of the winch control to "Free-Spooling" condition.

3,732,571

MICROWAVE HORN AERIAL WITH SPIRAL CORRUGATED INNER SURFACE

Noel William Thomas Neale, Halstead, England, assignor to The Marconi Company Limited, Essex, England

Filed Nov. 5, 1971, Ser. No. 196,085
Claims priority, application Great Britain, Nov. 24, 1970, 55,767/70
Int. Cl. H01q 13/00
U.S. Cl. 343—786 **6 Claims**



A microwave horn aerial is corrugated on its inner surface by being formed, e.g. by a screw cutting operation with a single start spiro helical groove or by moulding on a mandrel. In the latter case manufacture is relatively easy because the mandrel can be withdrawn by unscrewing it.

3,732,572

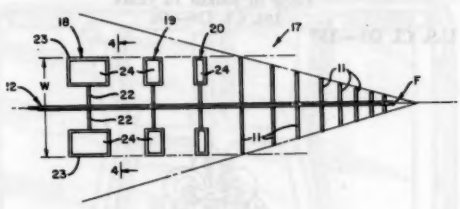
LOG PERIODIC ANTENNA WITH FORESHORTENED DIPOLES

Samuel Chung-Shu Kuo, Cupertino, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Continuation-in-part of Ser. No. 50,782, June 19, 1970, abandoned. This application Nov. 22, 1971, Ser. No. 200,681

Int. Cl. H01q 11/10

U.S. Cl. 343—742.5 7 Claims



A log periodic antenna comprising foreshortened dipoles, each having a profile corresponding to the interior cross section of a hollow ridged waveguide. One or more of the elements of the array, usually those which are resonant at relatively low frequencies (HF and low VHF bands) are so foreshortened and each is formed with conductive wire for an open-type element or conductive sheet or film for a solid type dipole. The dipole has the profile of the interior cross section of either a double ridged or a single ridged waveguide and is oriented with the plane of the dipole either parallel to or transversely of the plane containing the axis of the array. A coplanar array of log periodic dipole arrays consisting of such foreshortened dipoles exhibius substantially improved gain and radiation pattern characteristics as compared to a coplanar array of conventional log periodic dipole arrays.

3,732,573

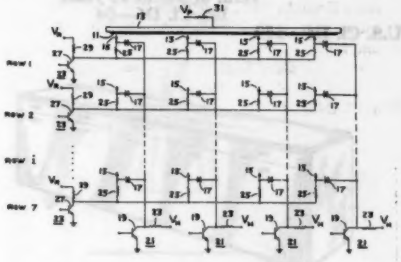
ELECTROGRAPHIC PRINTER MATRIX CIRCUIT

Joseph Merka, Northvale, and James L. Hudson, Montclair; both of N.J., assignors to Ing. C. Olivetti & C., S.P.A., Ivrea, Italy

Filed Aug. 11, 1971, Ser. No. 170,804

Int. Cl. G01d 15/06; H04l 15/34

U.S. Cl. 346—74 ES 4 Claims

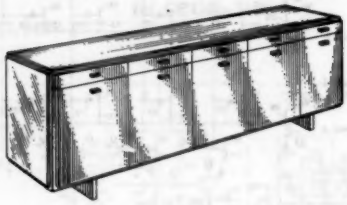


An electrographic printer having a multiplex matrix type driving circuit for the printing styli, thereby reducing the number of high voltage switches needed to drive the styli. The styli are grouped into N groups, each containing M styli. A first set of N selectively actuable driving circuits are connected by unidirectionally conductive means to the styli of the corresponding groups, and a second set of M selectively actuable driving circuits are connected by resistive means to the corresponding styli from each of the groups. Means are also provided for selectively simultaneously activating one of said driving circuits from said first set, and selected ones of said driving circuits from said second set, for depositing charge on the paper in image configuration.

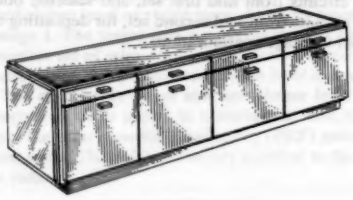
DESIGNS

MAY 8, 1973

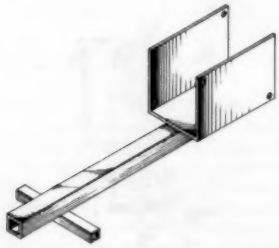
226,831
CONSOLE
Davis B. Allen, New York, N.Y., assignor to The General Fireproofing Company, Youngstown, Ohio
Filed Oct. 8, 1970, Ser. No. 25,379
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



226,832
CONSOLE
Davis B. Allen, New York, N.Y., assignor to The General Fireproofing Company, Youngstown, Ohio
Filed Oct. 8, 1970, Ser. No. 25,386
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159

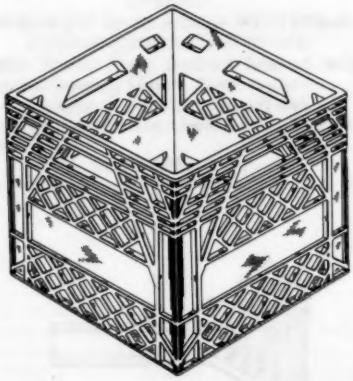


226,833
CONCRETE RAFTER SUPPORT
Marvin L. Rich, 1018 Opal, Boise, Idaho 83705
Filed Apr. 9, 1971, Ser. No. 132,926
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235

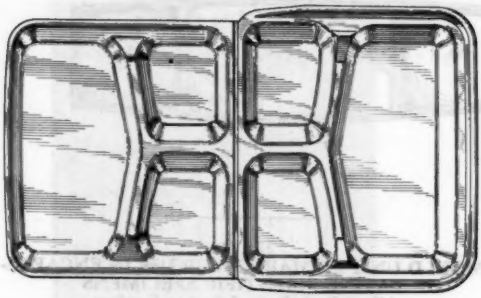


226,834
HANGER, FOR PICTURES, MIRRORS, PLAQUES, OR THE LIKE
L. Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed June 11, 1971, Ser. No. 152,481
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—257

226,835
BOTTLE CRATE
John D. Van Geem, 3931 Parkside Ave., Erie, Pa. 16508
Filed Feb. 23, 1971, Ser. No. 118,209
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



226,836
COVERED HOT FOOD TRAY
Steve Cyr and Mark Whelan, Chippewa Falls, Wis., assignors to Standard Oil Company, Chicago, Ill.
Filed Jan. 29, 1971, Ser. No. 111,166
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185

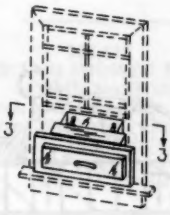


226,837
COMBINED DISPLAY AND PACKAGING CONTAINER FOR FOOD OR THE LIKE
Peter J. Le Cody, 5412 W. Ferdinand St., Chicago, Ill. 60644
Filed Apr. 1, 1971, Ser. No. 130,557
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220

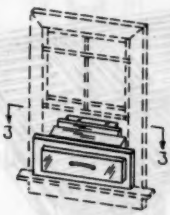
226,838
COMBINED PET FOOD BAR DISPLAY TRAY AND FEEDER OR SIMILAR ARTICLE
William Ruskin, Brooklyn, N.Y., assignor to Hartz Mountain Pet Foods, Inc., New York, N.Y.
Filed Sept. 15, 1971, Ser. No. 180,956
Term of patent 14 years
Int. Cl. D9—*04*; D30—*03*
U.S. Cl. D9—244

226,839
COMBINATION CLOSURE AND SUPPORT HOOK FOR A COLLAPSIBLE TUBE
Harold B. Jennings, 1602 Travis Heights Blvd., Austin, Tex. 78704
Filed June 14, 1971, Ser. No. 153,125
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—261

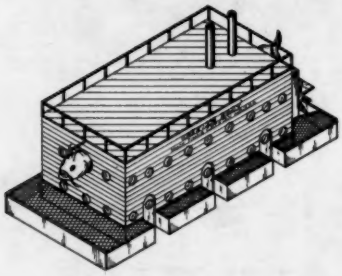
226,840
RETRACTABLE WINDOW CASE STRUCTURE AND SUPPORT THEREFOR
John P. Francis, 20 Boston St., Haverhill, Mass. 01830
Continuation-in-part of design application Ser. No. 179,248, Sept. 9, 1971. This application Sept. 27, 1971, Ser. No. 184,328
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 M



226,841
RETRACTABLE WINDOW CASE STRUCTURE AND SUPPORT THEREFOR
John P. Francis, 20 Boston St., Haverhill, Mass. 01830
Continuation-in-part of design application Ser. No. 179,248, Sept. 9, 1971. This application Sept. 27, 1971, Ser. No. 184,329
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 M

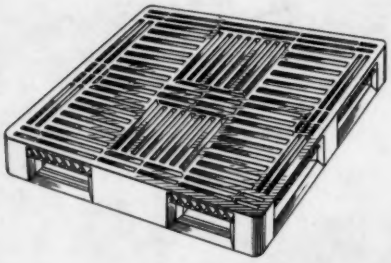


226,842
RESTAURANT
Ralph P. Armstrong, 1403 Maple Ave., La Marque, Tex. 77568
Filed Oct. 29, 1971, Ser. No. 194,093
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

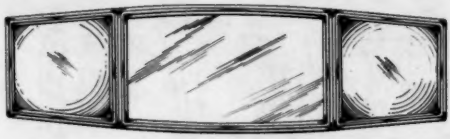


226,843
RESTAURANT BUILDING
Thomas C. Katris, 8225 Kraay St., Munster, Ind. 46321
Filed Mar. 7, 1972, Ser. No. 232,647
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 B

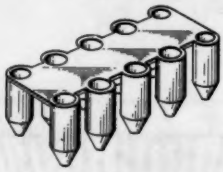
226,844
PALLET
Theodor M. Box, 1108 Aileen Road, Brielle, N.J.
Filed Oct. 22, 1971, Ser. No. 191,965
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3 N



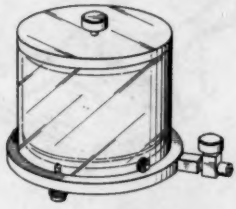
226,845
AUTOMOTIVE REAR VIEW MIRROR
Sol H. Lapidus, Great Neck, N.Y., assignor to Blue Fox Industries, Inc., Brooklyn, N.Y.
Filed Aug. 4, 1971, Ser. No. 169,166
Term of patent 7 years
Int. Cl. D12—*08*
U.S. Cl. D14—6 M



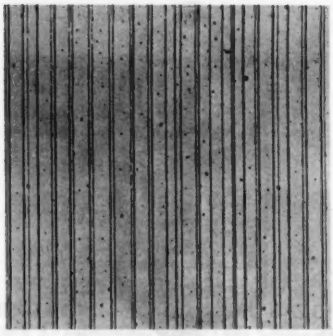
226,846
MOULD UNIT PRIMARILY FOR USE IN ENCAPSULATING SCIENTIFIC SPECIMENS
Albert Rosenburg, 6 Boston Gardens, Brentford, England
Filed Sept. 18, 1970, Ser. No. 25,064
Claims priority, application Great Britain Mar. 18, 1970
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D16—1



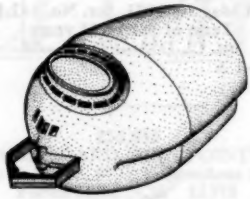
226,847
BAROMETER TEST CHAMBER
James Robert King, Van Nuys, and Gerald D. Myers, Sepulveda, Calif., assignors to King Nutronics Corporation, Van Nuys, Calif.
Filed May 5, 1972, Ser. No. 250,863
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D16—2 C



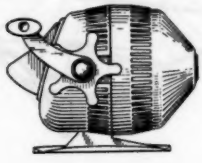
226,848
WALL PANEL
Francis E. Dreazy, Riverside, Calif., assignor to Evans Products Company, Portland, Oreg.
Filed May 26, 1971, Ser. No. 147,290
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 B



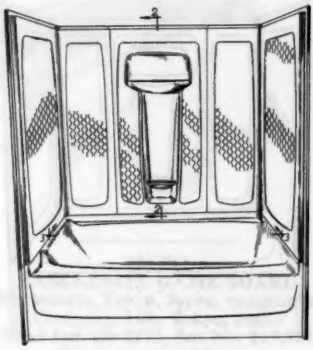
226,849
BAIT BUCKET
Richard G. Woolworth and Anthony J. Souza, Lancaster, and Harper Landell, Fort Washington, Pa., assignors to Woodstream Corporation, Lititz, Pa.
Filed Apr. 13, 1971, Ser. No. 133,779
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—18



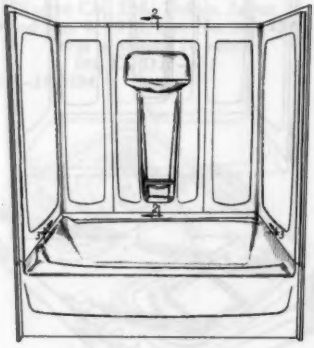
226,850
CLOSED FACE SPINNING REEL
R. Dell Hull, Rte. 1, Box 310, Catoosa, Okla. 74015
Filed Nov. 8, 1971, Ser. No. 196,868
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



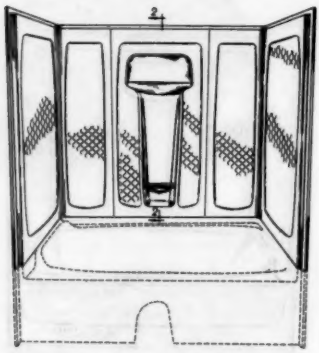
226,851
BATHTUB AND SHOWER ENCLOSURE COMBINATION
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Feb. 28, 1972, Ser. No. 230,171
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



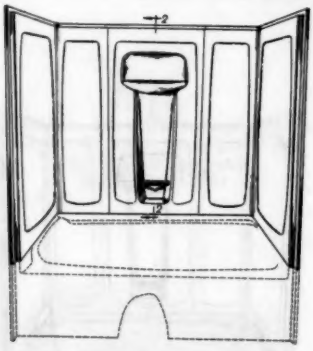
226,852
BATHTUB AND SHOWER ENCLOSURE COMBINATION
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Feb. 28, 1972, Ser. No. 230,173
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



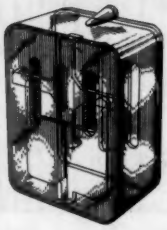
226,853
SHOWER ENCLOSURE
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Feb. 28, 1972, Ser. No. 230,172
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



226,854
SHOWER ENCLOSURE
Stanley F. Korol, Mansfield, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Feb. 28, 1972, Ser. No. 230,183
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

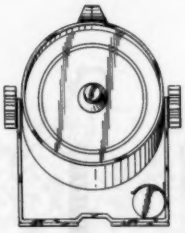


226,855
AIR FRESHENER CONTAINER
Paul E. Rosen, 1541 W. Ashcroft Ave., Fresno, Calif. 93705
Filed May 17, 1971, Ser. No. 144,354
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—150

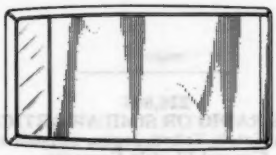


226,856
ELECTRICAL CABLE CLAMP
Alfonso Leto, 12255 Gerald Ave., Granada Hills, Calif. 91344, and Frank Leto, 8936 Amestoy Ave., Northridge, Calif. 91324
Filed May 10, 1971, Ser. No. 142,123
Term of patent 14 years
Int. Cl. D13—*03;* D8—*08*
U.S. Cl. D26—1 A

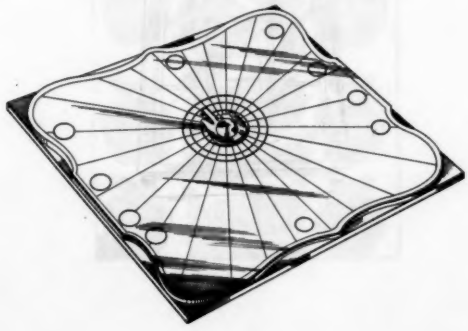
226,857
SONIC FISH DETECTOR
Jan A. Van Den Broek, Ann Arbor, and George W. Toma, Dexter, Mich., assignors to Transidyne General Corporation, Ann Arbor, Mich.
Filed June 1, 1971, Ser. No. 149,120
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D26—1 Q



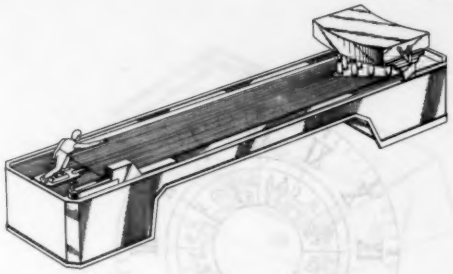
226,858
CASING FOR AN ELECTRONIC CALCULATOR
Edward T. Liljenwall, Sunnyvale, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Continuation-in-part of design application Ser. No. 111,787, Feb. 1, 1971. This application June 28, 1972, Ser. No. 266,946
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



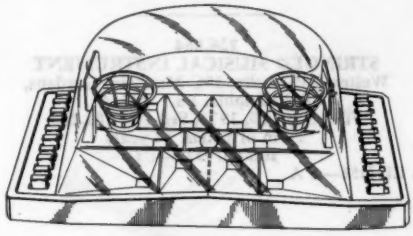
226,859
GAME BOARD WITH POINTER
Jacob B. Burke, 6771 Yellowstone Blvd., Forest Hills, N.Y. 11375
Filed Mar. 19, 1971, Ser. No. 126,395
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



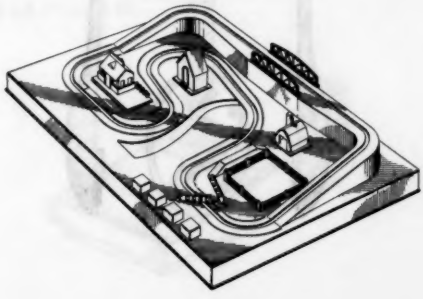
226,860
BOWLING GAME APPARATUS
Taketora Maeda, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Sept. 21, 1971, Ser. No. 182,573
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 BB



226,861
BASKETBALL GAME BOARD
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Jan. 13, 1972, Ser. No. 217,717
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



226,862
TOY TRACKWAY
Eijiro Tomiyama, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan
Filed Jan. 4, 1972, Ser. No. 215,452
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 MM

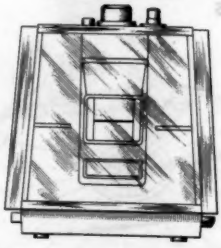


226,863
ZODIAC CLOCK FACE
Lewis E. Zorzy, 20 Waterside Road, Marblehead, Mass. 01945
Continuation-in-part of design application Ser. No. 18,420, July 25, 1969. This application Oct. 26, 1970, Ser. No. 25,655
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D42—1

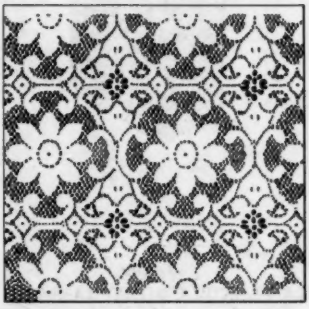
226,864
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed Sept. 20, 1971, Ser. No. 182,280
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

226,865
STRINGED MUSICAL INSTRUMENT
Walter J. Pelensky, 19C Manheim Gardens, Philadelphia, Pa. 19144
Filed Sept. 20, 1971, Ser. No. 182,281
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

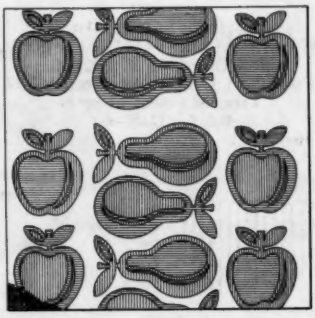
226,866
TABLE RADIO OR SIMILAR ARTICLE
Akira Katoh, Tokyo, Japan, assignor to General Electric Company
Filed May 28, 1971, Ser. No. 148,292
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



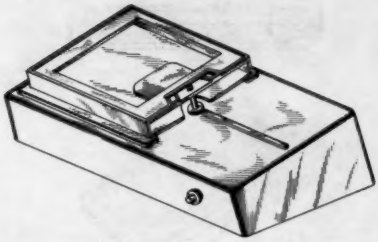
226,867
PAPER TOWELING
Mary Ellen Wassenberg, Green Bay, Wis., assignor to Fort Howard Paper Company, Green Bay, Wis.
Filed Mar. 25, 1971, Ser. No. 128,210
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D59—2 A



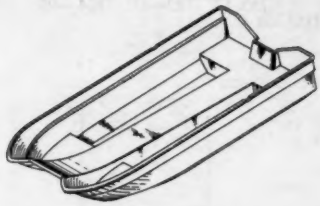
226,868
PAPER TOWELING
Nicholas Sidjakov, Sausalito, Calif., assignor to Fort Howard Paper Company
Filed Apr. 19, 1971, Ser. No. 135,537
Term of patent 14 years
Int. Cl. D5—*03*
U.S. Cl. D59—2



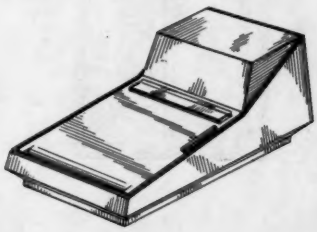
226,869
SHUTTLE-TYPE PICTURE VIEWER
John H. Weggeland, P.O. Box 204, Lehigh Acres, Fla. 33936
Filed Nov. 4, 1970, Ser. No. 25,831
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1



226,870
BOAT
David T. Livingston, 4338 SW. Willow St., Seattle, Wash. 98116
Filed Aug. 2, 1971, Ser. No. 168,520
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 Q

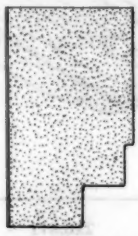


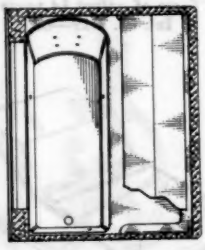
226,871
MEMO PAPER HOLDER
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougal, Inc., Roseland, N.J.
Filed Apr. 7, 1971, Ser. No. 132,260
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 C



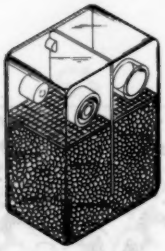
226,872
CAMP STOVE
Raymond E. Benson, Oak Park, Ill., assignor to Olin Corporation
Filed May 21, 1971, Ser. No. 145,999
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D81—10 G

226,873
PRE-FABRICATED SAUNA THERAPY BATH UNIT
Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733
Filed Mar. 26, 1971, Ser. No. 128,653
Term of patent 14 years
Int. Cl. D23—*02;* D24—*99*
U.S. Cl. D83—1 C

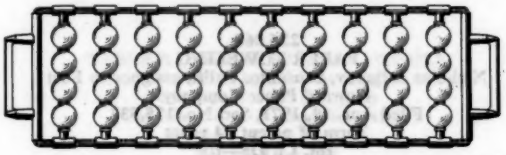




226,874
DISPOSABLE FILTER CANISTER FOR A BREATHING SYSTEM
Gale E. Dryden, Indianapolis, Ind., assignor to Dryden Corporation, Indianapolis, Ind.
Filed May 28, 1971, Ser. No. 148,271
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 G

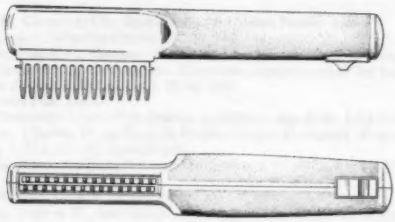


226,875
PORTABLE FLEXIBLE BODY-MASSAGE DEVICE
Chester M. Haworth, Jr., 4002 S. Clay St., Denver, Colo. 80101, and Frank R. Larmer, 10613 W. 101 Terrace, Overland Park, Kans. 66214
Filed Feb. 9, 1972, Ser. No. 225,010
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 T



226,876
FOLDABLE COMB
Willie Lee Morrow, 4167–9 Market St., San Diego, Calif. 92106
Filed Nov. 1, 1971, Ser. No. 194,794
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8

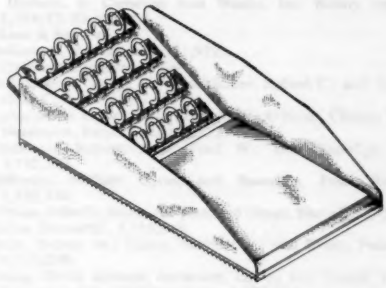
226,877
POWER DRIVEN HAIR COMB
James E. Tucker, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.
Filed Apr. 10, 1972, Ser. No. 242,913
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



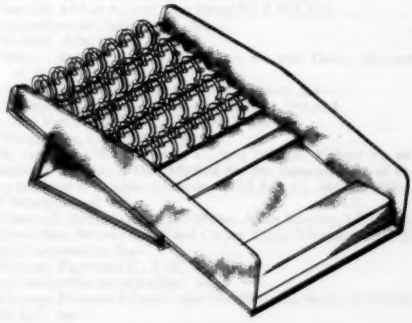
226,878
FACE SHIELD
Charles R. Jageman, 2710 W. 31st St., Erie, Pa. 16506
Filed Sept. 3, 1971, Ser. No. 177,921
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A

226,879
LUGGAGE CASE
Thomas D. Tweedie, 2226 Fairgreen Ave., Monrovia, Calif. 91016
Filed Feb. 10, 1971, Ser. No. 114,409
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 F

226,880
LOOSE-LEAF BINDER
Harlow G. Wetmore, Delmar, N.Y., assignor to Buchan Loose Leaf Records Company, Clifton Heights, Pa.
Filed Apr. 27, 1972, Ser. No. 248,358
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D97—1



226,881
LOOSE-LEAF BINDER
Harlow G. Wetmore, Delmar, N.Y., assignor to Buchan Loose Leaf Records Company, Clifton Heights, Pa.
Filed Apr. 27, 1972, Ser. No. 252,971
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D97—1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MAY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. & M. Cousin et Cie, Etablissements Cousin Freres: *See*—
Cousin, Maurice Claude, 3,731,342.

Aasen, Torulf F.; Kiernan, Philip; and Mogil, Bernard, to Copystatics Manufacturing Corporation. Exposure control system for reproduction device. 3,731,611, Cl. 95-62.000.

AB Tetra Pak: *See*—
Holmstrom, Sven Nils Hakan; and Olsen, Jan-Erik, 3,732,050.

Abbott, Charles N., to Dayton Bright Copper Company. Copper plating. 3,732,151, Cl. 204-52.00r.

Acaba, Peter. Air pollution control device. 3,732,075, Cl. 23-284.000.

Ace Controls, Inc.: *See*—
Bindon, Glyn A., 3,731,770.

Acker, Robert H.; and Murphy, Francis H., to Singer Company, The, mesne. Star tracker system. 3,731,544, Cl. 74-5.220.

Ackerfeldt, Bo Ingemar, to U.S. Natural Resources, Inc. Sawing system for sawing of logs sorted to diameter class. 3,731,578, Cl. 83-731.000.

Ackerman, Bernard, to Electro-Catheter Corporation. Method of making a catheter. 3,731,376, Cl. 29-624.000.

Ackerman, James H., to Sterling Drug Inc. Iodinated bis(aminobenzoic acids) and esters thereof. 3,732,293, Cl. 260-516.000.

Acme Visible Records, Inc.: *See*—
Fleischhauer, Eugene T., 3,731,789.

Acme-Cleveland Corporation: *See*—
Barkhurst, Ernest F., 3,731,565.

Addison, Christopher D., to Sun Oil Company of Pennsylvania. Scraper assembly for process vessels. 3,731,339, Cl. 15-246.500.

Addmaster Corporation: *See*—
Berry, William A., 3,732,387.

Addressograph-Multigraph Corporation: *See*—
Artl, Kenneth M., 3,731,358.

Adkinson, Archie D., Jr. Door lock. 3,731,965, Cl. 292-292.000.

Advanced Drainage Systems, Inc.: *See*—
Martin, Ronald C.; and Sixt, Marty E., 3,732,046.

Aerojet-General Corporation: *See*—
Gold, Marvin H.; and Marcus, Henry J., 3,732,289.
Grakauskas, Vytautas; and Remanick, Allen H., 3,732,291.

Ag-Pak, Inc.: *See*—
Crabb, Jasper R., 3,731,454.

Ageev, Georgy Sergeevich; Kuptsov, Ivan Pavlovich; and Jusim, Lev Veniaminovich, to Vsesojuzny Gosudarstvenny Ordena Lenina Proektny Institute "Teploelektroproekt". Method of forming structures by deposition. 3,731,492, Cl. 61-30.000.

Agence Nationale de Valorisation de la Recherche (Anvar): *See*—
Paris, Rene A.; Thibaudon, Dominique; Roubin, Marc P.; and Paris, Jacques M., 3,732,091.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bickl, Horst; Lange, Joachim; Neumann, Heinrich; Goschin, Bernhard; and Reider, Alois, 3,732,461.
Hujer, Friedrich; and Fengler, Harald, 3,732,430.
Wick, Richard; and Bestenreiner, Friedrich, 3,731,994.

Agrico Chemical Company, mesne: *See*—
Breathitt, Harvie W., Jr.; Evans, Robert D.; and Houston, Wesley M., 3,732,090.

Agusta, Benjamin; Bardell, Paul H.; Castrucci, Paul P.; Henle, Robert A.; and Pecorato, Raymond P., to International Business Machines Corporation. Menolithic integrated structure including fabrication and packaging therefor. 3,731,375, Cl. 29-577.000.

Akgulian, Sahag C.; Haffner, Donald G.; and Heth, Sherman C., to Jacobsen Manufacturing Company. Convertible gang lawn mower. 3,731,469, Cl. 56-7.000.

Aktiebolaget Bahco Ventilation: *See*—
Gustavsson, Karl Axel Goran, 3,731,811.

Aktiebolaget Leo: *See*—
Fex, Hans Jacob; Hogberg, Knut Bertil; and Konyves, Imre, 3,732,260.

Aktiengesellschaft Brown Boveri & Cie: *See*—
Bellati, Hans; and Pfenicher, Peter, 3,731,702.

Albrecht, Werner: *See*—
Rapp, Werner; and Albrecht, Werner, 3,732,503.

Alessio, Eugene T. Animal cage. 3,731,657, Cl. 119-17.000.

Alexeff, Alexander V., to Alexeff-Snyder Enterprises, Inc. Tensioning apparatus. 3,731,889, Cl. 242-156.200.

Alexeff-Snyder Enterprises, Inc.: *See*—
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Alfa Romeo S.p.A.: *See*—
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Alfa-Laval AB: *See*—
Jenssen, Sverre Knut, 3,731,737.

Allcock, Harry Rex, to Firestone Tire & Rubber Company, The. Cross-linking of phosphazene polymers. 3,732,175, Cl. 260-2.00p.

Allen and Hanburys Limited: *See*—
Lunts, Lawrence H. C.; and Toon, Paul, 3,732,300.

Allen Electric and Equipment Company: *See*—
Haley, David M.; and Bergantzel, Richard P., 3,731,331.

Allen, Herbert, to Cameron Iron Works, Inc. Rotary operator. 3,731,599, Cl. 92-122.000.

Allen, Sam, & Son: *See*—
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Allied Chemical Corporation: *See*—
Collingwood, George H.; Winckhofer, Robert C.; and Weedon, Gene C., 3,731,815.
Curtis, Omer E., Jr.; Tuller, Harold W.; O'Neill , Charles T.; and Nussbaum, Ralph W., 3,732,332.
Fuhrmann, Robert; Koff, Fred W.; and Pisanchyn, John, 3,732,303.
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O'Brien, John B.; Stone, Herman; and Ulmer, Harry E., 3,732,220.
Radke, Donald G., 3,731,949.
Spatz, Sydney M.; Bailey, Maurice E.; and Evans, Francis E., 3,732,239.
Young, David Edward; Anderson, Lowell Ray; Gould, Douglas Eugene; and Fox, William Burke, 3,732,274.

Allis-Chalmers Corporation: *See*—
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Allis-Chalmers Manufacturing Company: *See*—
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Allmanna Svenska Elektriska Aktiebolaget: *See*—
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Almog, Ehud. Panel constructions. 3,732,138, Cl. 161-43.000.

Alps Electric Co., Ltd.: *See*—
Ohkita, Masao, 3,732,386.

Altenburger, Otto; and Stoddard, David W., to Stromberg-Carlson Corporation. Outgoing trunk marker. 3,732,377, Cl. 179-18.00r.

Altmann, Conrad, to Eastman Kodak Company. Electrostatographic compensation apparatus. 3,732,003, Cl. 355-3.000.

Aluminum Company of America: *See*—
Mahns, Maurice W.; and Stockdale, Clark O., Jr., 3,731,519.

Alza Corporation: *See*—
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American Can Company: *See*—
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American Home Products Corporation: *See*—
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Santilli, Arthur A.; and Kim, Dong H., 3,732,226.

American Optical Corporation: *See*—
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American Screen Process Equipment Company: *See*—
Bubley, Henry J.; and Oltra, Claude H., 3,731,623.

American Van Tongeren Corporation: *See*—
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Amos, James L.; Bird, Arnett L.; and Snyder, Robert P., to Dow Chemical Company, The. Method for the incorporation of filamentary material in a resinous matrix. 3,732,345, Cl. 264-329.000.

AMP Incorporated: *See*—
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Henschen, Homer Ernst; and Carter, Clyde Thomas, 3,732,525.

Ampex Corporation: *See*—
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Amsted Industries Incorporated: *See*—
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Amtel, Inc.: *See*—
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Anderson, Carl W., Jr., to Susquehanna Corporation, The. Gas source. 3,731,843, Cl. 222-3.000.

Anderson, Earl R., to Brex Corporation; trustee. Sizer conveyor. 3,731,798, Cl. 209-98.000.

Anderson, Frank R.; and Castro, Albert J., to Westates Space-Era Products Inc. Ribbon-inking machine. 3,731,649, Cl. 118-6.000.

Anderson, Lowell Ray: *See*—

Young, David Edward; Anderson, Lowell Ray; Gould, Douglas Eugene; and Fox, William Burke, 3,732,274.

Andreassen, Bjorn Arild: *See—*
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Andrews, Clarence W., Jr. Bench for simulating and developing swimming movements. 3,731,921, Cl. 272-71.000.

Anger, Ernest G.; Richards, Giles J.; Bloodgood, John F.; and Geiger, Roy J., to Square D Company. Positioning control system for a machine that performs work on a moving part. 3,732,474, Cl. 318-257.000.

Anheuser-Busch, Inc.: *See—*
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Anheuser-Busch, Incorporated: *See—*
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Anjac Mfg. Co., Inc.: *See—*
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Annett, Leland W.; and Wallin, George J., to Minnesota Mining & Manufacturing Company. Sound-slide projector. 3,732,000, Cl. 353-19.000.

Appenzeller, Valentin; and Leifeld, Ferdinand, to Textilausruestungs-Gesellschaft Schroers & Co. Apparatus for textile dyeing. 3,731,503, Cl. 68-295.00r.

Appleton Machine Company: *See—*
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Aquila, Werner: *See—*
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Arikawa, Masayasu; and Iio, Katsuro, to Kobe Steel Ltd. One-side back bead forming butt-welding process using a thermosetting backing composite. 3,731,868, Cl. 228-50.000.

Arkansas Rock and Gravel Co.: *See—*
Holland, John H.; and Fox, Gene O., 3,731,825.

Arnold, Herbert; Brock, Norbert; Bourseaux, Friedrich; and Bekel, Heinz, to Asta-Werke Aktiengesellschaft Chemische Fabrik. N', O-propylene phosphoric acid ester diamides. 3,732,340, Cl. 260-936.000.

Arnold, Joe F., to United Aircraft Corporation. Reflecting means for beam control utilizing movable members for adjustment. 3,731,991, Cl. 350-294.000.

Arnold, Loren Glenn: *See—*
Sullivan, James Franklin; and Arnold, Loren Glenn, 3,731,748.
Sullivan, James Franklin; and Arnold, Loren Glenn, 3,731,749.

Arnold, Robert J., to Universal Oil Products Company. Rubber formulations containing thiolsulfonate esters. 3,732,192, Cl. 260-79.50b.

Artl, Kenneth M., to Addressograph-Multigraph Corporation. Roll for pressure fusing toner at elevated temperatures. 3,731,358, Cl. 29-132.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
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Asta-Werke Aktiengesellschaft Chemische Fabrik: *See—*
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Astleford, John J., Jr.: *See—*
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Astrolab, Inc.: *See—*
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Audesse, Emery G.; Westlund, Arnold E., Jr.; and Sadoski, Tadius T., to GTE Sylvania, Incorporated. Disclosing light. 3,732,416, Cl. 240-41.150.

Aulthouse, Robert R.: *See—*
Rushing, Frank C.; and Aulthouse, Robert R., 3,732,357.

Austin, Max M.; and Boulton, Norman B., to National-Standard Company. Slip clutch assembly. 3,731,773, Cl. 192-41.00s.

Autelca AG: *See—*
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Autic Developments Limited: *See—*
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Automated Building Components, Inc.: *See—*
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Automatic Switch Co., mesne: *See—*
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Autovox S.p.A.: *See—*
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Awe, Russell C.; Burton, James C.; and Blank, Thomas G., to Modine Manufacturing Company. Tube and fin heat exchanger. 3,731,732, Cl. 165-181.000.

Axelrod, Sydney, to United States of America, Army. Waterproofing mortar ammunition. 3,731,634, Cl. 102-103.000.

Axmark, Roger E.; and Erickson, Clifford W., to Honeywell Inc. Ultraviolet radiation detector with 360 angular sensitivity. 3,732,452, Cl. 313-98.000.

Baba, Theodore B., to National Distillers and Chemical Corporation. Continuous process for the production of alfin polymers. 3,732,194, Cl. 260-82.100.

Bach, Hartwig C., to Monsanto Company. Polyamide acids of certain tetracarboxylic acid and certain azo containing diamines. 3,732,200, Cl. 260-144.000.

Bachelder, Albert J.: *See—*
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Badische Anilin- & Soda-Fabrik Aktiengesellschaf: *See—*
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Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
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Platz, Rolf; Decker, Martin; Buerger, Gert; and Stechl, Hans-Helge, 3,732,275.

Baggers (Proprietary) Limited: *See—*
Daneel, Charl M., 3,732,032.

Bahnsen, Erwin B., to Steiner American Corporation. Method for rinsing fabric articles. 3,732,072, Cl. 8-149.100.

Bailey, Grant C., to Phillips Petroleum Company. Process for separating halogenated hydrocarbons by azeotropic distillation with ammonia. 3,732,150, Cl. 203-44.000.

Bailey, Maurice E.: *See—*
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Bailey Meter Company: *See—*
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Bajoczky, Laszlo: *See—*
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Baker, Don R.: *See—*
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Baker, George Edward March: *See—*
Wing, Willis Guy; Baker, George Edward March; and Smith, Rodney Frank, 3,732,479.

Baker, Hugh William Barnes, to Gillette Company, The. Device for the storage, mixing and dispensing of ingredients. 3,731,844, Cl. 222-83.000.

Baker, Maurice William; Crowley, Jennifer; Watkins, Thomas Iswel; and Clark, Nigel George, to Boots Pure Drug Company. Carbamoylbenzotriazole anthelmintics. 3,732,238, Cl. 260-308.00b.

Baker, Roy L. Gun holster. 3,731,858, Cl. 224-2.00b.

Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; and Shulzhenko, Alexandr Alexandrovich. High-pressure and high-temperature device. 3,732,043, Cl. 425-77.000.

Balasubramaniam, Dhanikodi: *See—*
Christiansen, Robert A.; and Balasubramaniam, Dhanikodi, 3,732,507.

Balle, Gerhard; and Kolb, Gunter, to Bayer Aktiengesellschaft. Self-crosslinkable copolymers. 3,732,190, Cl. 260-78.50r.

Balthes Farm Equipment Manufacturing Limited: *See—*
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Balthes, John, to Balthes Farm Equipment Manufacturing Limited. Agricultural leaf picking machine. 3,731,475, Cl. 56-27.500.

Balzer, Hans; Fleck, Fritz; Mercer, Alec Victor; and Paver, Roger, to Sandoz Ltd.; a/k/a Sandoz AG. Novel triazole compounds. 3,732,213, Cl. 260-240.0ca.

Banner, Joseph, to Anjac Mfg. Co., Inc. Sliding-door corner junction and support structure. 3,731,431, Cl. 49-420.000.

Banyaszati Tervezo Intezet: *See—*
Benedek, Miklos; Irsai, Tamas; Kekete, Sandor; Ambrus, Sandor; and Savolyi, Istvan, 3,731,977.

Baran, Henri: *See—*
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Baranoff, Albert J. Intermittent type drum advancing mean in a high speed printer. 3,731,622, Cl. 101-93.00c.

Barber, Richard P.; and Moses, Glen R., to Burlington Industries, Inc. Process for producing durable press textiles. 3,731,411, Cl. 38-144.000.

Bardell, Paul H.: *See—*
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Bares, James D., to Milbar Corporation. Adjustable spanner wrench. 3,731,560, Cl. 81-90.00c.

Bargeton, Gilbert Louis: *See—*
Chaumont, Robert Jean; and Bargeton, Gilbert Louis, 3,732,378.

Barkely, John R., to Du Pont de Nemours, E. I., and Company. Process and apparatus for control of domain walls in the ferroelastic-ferroelectric crystals. 3,732,549, Cl. 340-173.200.

Barker, Theodore R., III: *See—*
Koomey, Paul C.; Streb, Alan J.; Stivers, George S.; and Barker, Theodore R., III, 3,732,534.

Barkhurst, Ernest F., to Acme-Cleveland Corporation. Toolholder. 3,731,565, Cl. 82-34.00r.

Baron, Seymour, to Fine Organics, Inc. Production of N-alkylated amines. 3,732,311, Cl. 260-583.00r.

Barr, Paul N.; Wilkinson, Lester; and Neal, Stuart M., to General Motors Corporation. Electronic fuel injection system having deceleration fuel control. 3,731,659, Cl. 123-32.0ea.

BASF Wyandotte Corporation: *See—*
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Bata Shoe Company, Inc: *See—*
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Batcho, Andrew David; and Leimgruber, Willy, to Hoffman-La Roche, Inc. Process and intermediates for the preparation of indoles from ortho-nitrotoluenes. 3,732,245, Cl. 260-319.100.

Battista, Albert D., to American Optical Corporation. Laser energy monitor circuit. 3,732,491, Cl. 324-102.000.

Bauer, Ludwig, to United States of America, Army. S-substituted thiosulfuric acid derivatives and preparation thereof. 3,732,305, Cl. 260-564.00r.

Bauer, Richard H.; and Kilpert, Richard, to Esso Research and Engineering Company. Spray foam insulated pipe. 3,731,710, Cl. 138-143.000.

Bauer, William J. Corrugated conduit. 3,731,711, Cl. 138-178.000.

Baum, John W.; and Erickson, Donald W., to Zoecon Corporation. 3-Alkoxy-α,β-unsaturated acids and esters. 3,732,264, Cl. 260-408.000.

Baumann, Erwin; and Beham, Gerhard. Multi-chamber receptacle. 3,731,853, Cl. 222-386.000.

Baumann, Hans G.; and Schneider, Heinz Dietrich, to Demag Aktiengesellschaft. Apparatus for continually measuring the temperature of a continuously cast metal rod. 3,731,536, Cl. 73-351.000.

Bausch & Lomb Incorporated: *See—*
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Bayer Aktiengesellschaft: *See—*
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Beach, Bill. Wheel alignment tool. 3,731,906, Cl. 254-100.000.

Beacom, Oliver J.; and MacBean, Donald G., to JWI Ltd. Insert for paper machine drainage elements. 3,732,142, Cl. 162-374.000.

Beal, Thomas E.; and Curnow, John W., to Sperry Rand Corporation. Power transmission. 3,732,041, Cl. 417-222.000.

Bean, Carl N., Jr. Combination car top rack and table. 3,731,859, Cl. 224-42.010.

Beatenbough, Paul K.; Nichols, Gary E.; and Scherer, Carl A., to General Motors Corporation. Automatic expansion valve, pad mounted, non-piloted. 3,731,498, Cl. 62-225.000.

Beatenbough, Paul K.; Dresch, Lewis E.; Hutchins, Ward H.; and Weiss, Walter W., to General Motors Corporation. Selector/programmer assembly for automatic temperature control. 3,731,729, Cl. 165-16.000.

Beaver, Thomas R.: *See—*
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Beck, James R., to Lilly, Eli, and Company. Synthesis of acronycine and related compounds. 3,732,204, Cl. 260-279.00r.

Beck, Kenneth O.: *See—*
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Beck, Manfred: *See—*
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Beck, Marilyn: *See—*
Hou, Shou-Ling; Marley, James A., Jr.; and Beck, Kenneth O., 3,732,471.

Becker, Philip D., to Buell Industries. Automobile bumper assembly. 3,731,961, Cl. 287-189.36f.

Beckman, Orval E.; and Klymkiw, Walter, to Zenith Radio Corporation. Fine-tuning and stereo indicator system. 3,732,498, Cl. 325-398.000.

Beecham Group Limited, mesne: *See—*
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Beerbower, Alan: *See—*
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Beezer, Earl F. Device for transmitting accurate translational and rotary movements. 3,731,545, Cl. 74-24.000.

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Behringwerke Aktiengesellschaft: *See—*
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Bekel, Heinz: *See—*
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Belknap, Jack S. Locking device for securing an outboard motor to a boat. 3,731,504, Cl. 70-58.000.

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Kindermann, Wilfred Julius; and Knab, Emil David, 3,731,513.
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Bellati, Hans; and Pfenicher, Peter, to Aktiengesellschaft Brown Boveri & Cie. Device for supporting the valve bodies of turbomachines. 3,731,702, Cl. 137-343.000.

Bendix Corporation, The: *See—*
Punako, Stephen, 3,732,526.
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Benedek, Miklos; Irsai, Tamas; Kekete, Sandor; Ambrus, Sandor; and Savolyi, Istvan, to Banyaszati Tervezo Intezet. Equipment for preparing underground drifts, e.g. tunnels, channels, shafts, etc. 3,731,977, Cl. 299-31.000.

Bening, Curtis Reinhard, to Deere & Company. Safe starting system for lawn and garden equipment. 3,731,471, Cl. 56-10.500.

Bennett, Robert Neil; and Morum, Francis John, to British Petroleum Company, Limited, The. Production of lubricating oils. 3,732,156, Cl. 208-111.000.

Benson, John T.: *See—*
Lewis, J. Stephen; Benson, John T.; Bosley, Denis V.; and Sapkus, Jurgis, 3,731,426.

Berg, Charles H.: *See—*
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Bergamaschi, Mario: *See—*
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Bergantzel, Richard P.: *See—*
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Berger, Julius; and Rosenberger, Michael, to Hoffmann-La Roche Inc. Microbiological preparation of optically active 9-oxo-5(S)-hydroxydecanoic acid and the lactone thereof. 3,732,268, Cl. 260-413.000.

Berle, Axel Gunnar; Nilsson, Lars Gunnar; and Olofsson, Hans Kristoffer, to Atlas Copco Aktieholag. Control valve for elastic pressure fluid. 3,731,707, Cl. 137-625.660.

Berlin, Aaron S.; Little, Vincent C.; and Leadore, Toney E., to United States of America, Army. Non protuberance munition. 3,731,631, Cl. 102-64.000.

Berman, Lawrence U., to Kraftco Corporation. Method for polymerizing fatty acids. 3,732,263, Cl. 260-407.000.

Bernardi Brothers, Inc.: *See—*
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Bernardi, Robert P., to Bernardi Brothers, Inc. Automatic car wash apparatus. 3,731,332, Cl. 15-21.00e.

Berner, David L.; Jacobson, Glen A.; and Trombold, Charles D., to Campbell Soup Company. Spice antioxidant principle and process for the extraction thereof. 3,732,111, Cl. 99-140.00r.

Berry, William A., to Addmaster Corporation. Key switch. 3,732,387, Cl. 200-159.00r.

Bertin, Daniel; Perronnet, Jacques; and Teche, Andre, to Roussel-UCLAF. Tetrahydropyrimidines. 3,732,228, Cl. 260-260.000.

Bertoni, Lucio: *See—*
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Bertva, John T.: *See—*
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Bethlehem Steel Corporation: *See—*
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Bettin, Hubertus, to Olympia Werke AG. Output device for electronic data processing systems. 3,732,408, Cl. 235-155.000.

Beutler, Daniel James: *See—*
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Beutler, Elzy Alonzo; and Beutler, Daniel James. Paint tray and handle unit. 3,731,840, Cl. 220-95.000.

Beyer, Norman H.; and Zuk, Joseph, to Chrysler Corporation. Master cylinder. 3,731,487, Cl. 60-54.60e.

Beyerle, Rudi; Stachel, Adolf; deceased (by Stachel, Ingeburg Lydia Katharina); Nitz, Rolf-Eberhard; Resag, Klaus; and Schraven, Eckhard, to Cassella Farbwerke Maimkur Aktiengesellschaft. Basically substituted coumarin compounds. 3,732,251, Cl. 260-343.20r

Bickart, Charles J.: *See—*
Hieslmair, Hans; Fulton, John N.; and Bickart, Charles J., 3,732,013.

Bickl, Horst; Lange, Joachim; Neumann, Heinrich; Goschin, Bernhard; and Reider, Alois, to Agfa-Gevaert Aktiengesellschaft. Unbalance detection circuits for plural parrallel lamp systems. 3,732,461, Cl. 315-130.000.

Bildfell, Johann T., to Trail-Air Scoop Limited. Aerodynamic deflector. 3,731,969, Cl. 296-1.00s.

Bindon, Glyn A., to Ace Controls, Inc. Adjustable shock absorber. 3,731,770, Cl. 188-285.000.

Bird, Arnett L.: *See—*
Amos, James L.; Bird, Arnett L.; and Snyder, Robert P., 3,732,345.

Birkenhagen, Manfred, to Sauer, J. P., & Sohn, GmbH. Small firearms with exchangeable barrel. 3,731,418, Cl. 42-75.00b.

Bishop, Dolloff F., Jr.: *See—*
Pressley, Thomas A.; and Bishop, Dolloff F., Jr., 3,732,164.

Black Clawson Company, The, mesne: *See—*

Reba, Imants; and Wolthausen, Edward C., 3,731,652.

Blackshear, Perry J.; Dorman, Frank D.; Blackshear, Perry L., Jr.; Buchwald, Henry; and Varco, Richard L., to University of Minnesota, The Regents of the. Implantable indusion pump. 3,731,681, Cl. 128-214.00f.

Blackshear, Perry L., Jr.: *See—*
Blackshear, Perry J.; Dorman, Frank D.; Blackshear, Perry L., Jr.; Buchwald, Henry; and Varco, Richard L., 3,731,681.

Blank, Thomas G.: *See—*
Awe, Russell C.; Burton, James C.; and Blank, Thomas G., 3,731,732.

Bleba, William P., Jr.: *See—*
Braunstein, Morris; and Bleba, William P., Jr., 3,732,429.

Blewitt, Donald D.; and Shaw, Woodrow G., to Westinghouse Electric Corporation. Current limiting fuse including radially disposed fuse elements. 3,732,515, Cl. 337-166.000.

Blocher, Glen L. Crimping die arrangement. 3,731,518, Cl. 72-402.000.

Bloodgood, John F.: *See—*
Anger, Ernest G.; Richards, Giles J.; Bloodgood, John F.; and Geiger, Roy J., 3,732,474.

Bloom, Leonard: *See—*
Rebold, Jerome I., 3,731,676.

Blumhardt, Harold. Swath treating apparatus. 3,731,468, Cl. 56-1.000.

Boatright, William B., to United States of America, National Aeronautics and Space Administration. Apparatus and method for generating large mass flow of high temperature air at hypersonic speeds. 3,731,528, Cl. 73-147.000.

Bocksruker, Ronald W., to TRW Inc. Linear displacement amplification device and deflection transducer embodying same. 3,731,548, Cl. 74-96.000.

Boehringer Ingelheim G.m.b.H.: *See—*
Koppe, Herbert; Zeile, Karl; and Traunecker, Werner, 3,732,277.

Boettcher, Stephen A.; Cesna, Joseph V.; and Dumentat, Raymond E., to Speedfam Corporation. Polishing machine load plate. 3,731,435, Cl. 51-129.000.

Bognar, Janos: *See—*
Szilas, A. Pal; Bognar, Janos; Mating, Bela; and Bajoczky, Laszlo, 3,732,035.

Bokum Tool Company, Inc.: *See—*
Heuser, Helmut C., 3,731,562.

Bolen, Gerhard N.; Gelin, Robert J.; and Haggerty, William N., to Owens-Corning Fiberglas Corporation. Method for producing a fibrous bundle with a tracer and product thereof. 3,732,140, Cl. 161-175.000.

Bolie, Victor W. Video pattern recognition system. 3,732,366, Cl. 178-6.800.

Boocock, David G. B.; and Ullman, Edwin F., to Syva Corporation. 1,3-Dioxy-2-Substituted-4,4,5,5-tetrahydrocarbon substituted delta2-dihydro- and imidazolines. 3,732,244, Cl. 260-309.600.

Booth, Jack J. System for dispensing chilled carbonated water. 3,731,845, Cl. 222-67.000.

Booth, Raymond E.: *See—*
Smith, Donald Paul; and Booth, Raymond E., 3,731,614.

Boots Pure Drug Company: *See—*
Baker, Maurice William; Crowley, Jennifer; Watkins, Thomas Iswel; and Clark, Nigel George, 3,732,238.

Borcoman, Mircea. Production line for products of prestressed concrete or of reinforced concrete. 3,732,044, Cl. 425-111.000.

Borg-Warner Corporation: *See—*
Wentworth, Robert Seabury, Jr., 3,731,595.

Borginon, Hendrik Alfons; and Claes, Frans Henri, to Gevaert-Agfa N.V. Production of photographic silver halide emulsions. 3,732,102, Cl. 96-94.000.

Borgo, Norman J., to Pittsburgh Forgings Company. Pneumatic-hydraulic shock absorber. 3,731,771, Cl. 188-289.000.

Borgos, Jerome E.: *See—*
Schliemann, Louis F.; and Borgos, Jerome E., 3,731,639.

Borsum, Adolph W.; and Borsum, William K. Push-pull connector having a shear-resistant locking ring. 3,731,955, Cl. 285-111.000.

Borsum, William K.: *See—*
Borsum, Adolph W.; and Borsum, William K., 3,731,955.

Bosch, Robert, G.m.b.H.: *See—*
Lindae, Gerhard, 3,732,415.

Bosley, Denis V.: *See—*
Lewis, J. Stephen; Benson, John T.; Bosley, Denis V.; and Sapkus, Jurgis, 3,731,426.

Botka, Julius K., to Hewlett-Packard Company. Impedance probe for swept network analyzer system. 3,732,490, Cl. 324-57.00r.

Bouley, Jean Claude, to Bunker Ramo Corporation. Electric contacts. 3,732,531, Cl. 339-217.00r.

Boulton, Norman B.: *See—*
Austin, Max M.; and Boulton, Norman B., 3,731,773.

Bourland, Andre: *See—*
Fourcade, Robert; and Bourland, Andre, 3,731,791.

Bourseaux, Friedrich: *See—*
Arnold, Herbert; Brock, Norbert; Bourseaux, Friedrich; and Bekel, Heinz, 3,732,340.

Boustany, Kamel; and Vander Kool, John P., to Monsanto Company. N-(Thio) diamides. 3,732,271, Cl. 260-453.00r.

Bowling, Charles E.; Meginnis, George B.; and Schwedland, Ronald P., to General Motors Corporation. Cooled airfoil. 3,732,031, Cl. 416-97.000.

Bowmar Instrument Corporation: *See—*
Dixon, Thomas E.; Herr, Robert W.; and Sigl, Edward D., 3,731,881.
Harden, Phillip L.; and Thomas, Samuel M., Jr., 3,732,560.

Boyden, Willis Guild. Tone control circuits. 3,732,373, Cl. 179-1.00d.

Boyer, Marcel Louis, to C.I.T.-Compagnie Industrielle des Telecommunication. Radio transmitter-received including means for automatically adjusting the transmission level. 3,732,496, Cl. 325-62.000.

Boyer, Marcel-Louis, to Compagnie Industrielle des Telecommunications Cit-alcatel. Electromechanical device for tape winding mechanism. 3,732,402, Cl. 235-61.11r.

Bozsik, Mihaly. Steering mechanisms. 3,731,757, Cl. 180-6.260.

Brackman, Donald Alvin, to Hobart Manufacturing Company, The. Charging apparatus. 3,731,345, Cl. 17-32.000.

Bradt, Robert D. Catamaran vessel and system for loading and utilizing a camper or trailer thereon. 3,731,644, Cl. 114-61.000.

Braithwaite, Isaak, & Son Engineers Ltd.: *See—*
Cusworth, Maurice, 3,732,394.

Brangle, Edward J., Jr. Quick-erect carton. 3,731,873, Cl. 229-41.00r.

Braun, Vernon F.: *See—*
Wilhelmson, Jack L.; Weichselbaum, Theodore E.; and Braun, Vernon F., 3,731,679.

Brauning, Gerhard: *See—*
Ort, Wolfgang; and Brauning, Gerhard, 3,732,058.

Braunschweigische Maschinenbauanstalt: *See—*
Schlums, Karl-Dieter, 3,731,500.
Wolff, Reinhard; and Dietzel, Walter, 3,731,613.

Braunstein, Morris; and Bleba, William P., Jr., to Hughes Aircraft Company. Liquid crystal device. 3,732,429, Cl. 250-213.00r.

Brazell, James W., to Heath International, Inc. Plow hitch. 3,731,750, Cl. 172-457.000.

Breathitt, Harvie W., Jr.; Evans, Robert D.; and Houston, Wesley M., to Agrico Chemical Company, mesne. Processing of phosphate rock. 3,732,090, Cl. 71-37.000.

Breimer, Hendrik; and Tan, Sing Liong, to U.S. Philips Corporation. Color television system having aperture correction. 3,732,360, Cl. 178-5.40r.

Breslow, Jeffrey D.; and Jaworski, Eugene, to Glass, Marvin, & Associates. Target receptacles having mechanism to dislodge projectiles tossed therein. 3,731,932, Cl. 273-102.10c.

Breuer, Hermann: *See—*
Treuner, Uwe; and Breuer, Hermann, 3,732,237.

Breuer, Hermann; Treuner, Uwe D.; and Schulze, Ernst, to Squibb, E. R., & Sons, Inc. Pyrazolo[3,4-d]pyrimidine derivatives. 3,732,225, Cl. 260-256.40f.

Brewer, Lani W.: *See—*
Ruoff, Laurence J.; and Brewer, Lani W., 3,731,890.

Brewer, Thomas K.; and Crawford, Charles D., to Dow Chemical Company, The. Liquid phase polychlorination of pyridine hydrochlorides. 3,732,230, Cl. 260-283.00r.

Brewster, John Holt; and Hoffman, Ted Leroy, to Bell Telephone Laboratories, Incorporated. Error checked incrementing circuit. 3,732,407, Cl. 235-153.0bb.

Brex Corporation; trustee: *See—*
Anderson, Earl R., 3,731,798.

Bride, John Edwin, to Du Pont de Nemours, E. I., and Company, mesne. Werner chromium complexes and methods for their preparation. 3,732,270, Cl. 260-438.50c.

Brignon, Andre; and Durand, Michel Georges, to Compagnie des Freins et Signaux Westinghouse. Fluid pressure operated motor or generator. 3,731,598, Cl. 92-125.000.

British Drug Houses Limited, The: *See—*
Bysouth, Peter Thomas; and Clarke, Robert William, 3,732,229.

British Iron and Steel Association, The: *See—*
Hoyle, Geoffrey; and Longbottom, David Melvin, 3,732,350.

British Iron and Steel Research Association, The: *See—*
Sabatini, Bruno; and Tarokh, Mahmoud, 3,731,508.

British Petroleum Company, Limited, The: *See—*
Bennett, Robert Neil; and Morum, Francis John, 3,732,156.

Brittan, Kenneth Walter; and Lovelock, James Ephraim. Apparatus for the collection and analysis of samples. 3,731,539, Cl. 73-421.50r.

Brock, Gregory C., Jr.; and Gambill, Ulysses T. Method and apparatus for processing molded bodies. 3,731,568, Cl. 83-23.000.

Brock, Norbert: *See—*
Arnold, Herbert; Brock, Norbert; Bourseaux, Friedrich; and Bekel, Heinz, 3,732,340.

Brockett, Bruce W.; Miller, Robert E.; and Hinkle, Mary L., to National Cash Register Company, The. Pressure-sensitive recording sheet. 3,732,120, Cl. 117-16.000.

Brockett, Bruce W.; and Miller, Robert E., to National Cash Register Company, The. Pressure-sensitive record material. 3,732,141, Cl. 117-36.800.

Brode, George L.: *See—*
Fritze, Peter E.; and Brode, George L., 3,732,250.

Brooks, Bernard; Farber, Jerome; and Roseman, Theodore, to Electro-Dent, Inc. Medical instrument. 3,731,384, Cl. 32-27.000.

Brooks, Merton H.: *See—*
Eddy, David S.; Sutherland, Glenn E.; Micheli, Adolph L.; and Brooks, Merton H., 3,732,056.

Brophy, Alfred H. Self stopping and locking screw. 3,731,725, Cl. 151-22.000.

Broughton, Donald B.: *See—*
Pharis, Joe M.; Zabransky, Robert F.; and Broughton, Donald B., 3,732,325.

Brouneus, Harold A., to Corning Glass Works. Temperature control systems. 3,732,432, Cl. 307-117.000.
Brown & Williamson Tobacco Corporation: *See—*
Sexstone, John H.; and Grimm, Wolfgang H., 3,731,451.
Brown, Charles H.: *See—*
Walters, Theodore M., 3,731,814.
Brown Company: *See—*
Buttery, Kenneth T., 3,731,870.
Buttery, Kenneth T.; and Haas, Richard G., 3,731,871.
Brown, D. S., Company, The: *See—*
Rizza, Michael C.; and Brown, Delmont D., 3,732,021.
Brown, Delmont D.: *See—*
Rizza, Michael C.; and Brown, Delmont D., 3,732,021.
Brown, Duane; and Carlson, Alton R. Process for preparing elemental mercury. 3,732,094, Cl. 75-101.00r.
Brown, Eric: *See—*
Cobb, Harold Ralph William; and Brown, Eric, 3,732,126.
Brown, Larry A.; and McMichael, James W., to Caterpillar Tractor Company. Clutch spring retainer assembly. 3,731,775, Cl. 192-89.00r.
Brumbaugh, Allen D.; and Mumford, Stanford A., to United States of America, Army. Continuous aerosol concentrator. 3,731,464, Cl. 55-270.000.
Brunnett, Carl J.; and Toannou, Basil N., to Picker Corporation. Automatic calibration system for a scintillation device. 3,732,420, Cl. 250-71.500.
Brunson, Glenn S.; Curran, Robert N.; and Just, Franklin H., to United States of America, Atomic Energy Commission. Counter for radiation monitoring. 3,732,422, Cl. 250-83.30r.
Bryant, Herbert William, to Bell Telephone Laboratories, Incorporated. Electroacoustic transducer resistant to external mechanical vibrations. 3,732,446, Cl. 310-9.400.
Brymill Corporation: *See—*
Bryne, Michael D., 3,731,690.
Bryne, Michael D., to Brymill Corporation. Venting cryosurgical instrument. 3,731,690, Cl. 128-303.100.
Bubley, Henry J.; and Oltra, Claude H., to American Screen Process Equipment Company. Glider press. 3,731,623, Cl. 101-114.000.
Buchalter, Gilbert. Cane or crutch tip. 3,731,698, Cl. 135-62.000.
Buchel, Karl Heinz: *See—*
Regel, Erik; Eue, Ludwig; and Buchel, Karl Heinz, 3,732,232.
Buchel, Karl Heinz; Meiser, Werner; Plempel, Manfred; and Metzger, Carl, to Farbenfabriken Bayer Aktiengesellschaft. Phenylimidazolyl-acetic or propionic acid derivatives. 3,732,242, Cl. 260-309.000.
Buchholz, William. Power module. 3,732,042, Cl. 417-477.000.
Buchwald, Henry: *See—*
Blackshear, Perry J.; Dorman, Frank D.; Blackshear, Perry L., Jr.; Buchwald, Henry; and Varco, Richard L., 3,731,681.
Buck, Daniel C., to Westinghouse Electric Corporation. Wideband deflection modulated semiconductor amplifier. 3,732,456, Cl. 315-3.000.
Buck, James R., to Buck Tool Company. Hydraulically actuated tool collet. 3,731,942, Cl. 279-4.000.
Buck Tool Company: *See—*
Buck, James R., 3,731,942.
Bueler, Richard C., to Wagner Electric Corporation. Control valve and system. 3,731,981, Cl. 303-22.00r.
Buell Industries: *See—*
Becker, Philip D., 3,731,961.
Buerger, Gert: *See—*
Platz, Rolf; Decker, Martin; Buerger, Gert; and Stechl, Hans-Helge, 3,732,275.
Bulanda, John Jean: *See—*
Caveney, Jack Edward; Moody, Roy A.; and Bulanda, John Jean, 3,731,347.
Buller, Joseph S.: *See—*
Kunimoto, Wallace Y.; and Buller, Joseph S., 3,732,421.
Bunker Ramo Corporation: *See—*
Bouley, Jean Claude, 3,732,531.
Burcham, Harry Logan, to Valley Tow-Rite, Inc. Adjustable load stabilizing trailer hitch. 3,731,950, Cl. 280-406.00a.
Burford, John Reginald: *See—*
Murphy, Brian Egmont; and Burford, John Reginald, 3,731,414.
Burgdorf, Jochen, to ITT Industries, Inc. Two-circuit wheel cylinder. 3,731,596, Cl. 92-52.000.
Burgess, Oakley B., 51% to Shook, Alvin L. Hedge trimmer. 3,731,476, Cl. 56-237.000.
Burke, David C.: *See—*
Pepmeier, Carl R.; Burke, David C.; and Jones, Allen P., 3,731,529.
Burke, William F.; Greenwood, Robert C.; and Jones, Thomas E., to Pan-Nova, Inc. Coin operated fluid dispenser. 3,731,777, Cl. 194-13.000.
Burlington Industries, Inc.: *See—*
Barber, Richard P.; and Moses, Glen R., 3,731,411.
Burns, Frederick B.: *See—*
Walsh, Vincent T.; Henningsen, Erik; and Burns, Frederick B., 3,731,338.
Burroughs Corporation: *See—*
Kondur, Nicholas Jr., 3,731,779.
Burroughs, Robert K.; and Wakefield, Timothy A., to LeBlond, R. K., Machine Tool Company. Measuring method and apparatus. 3,731,388, Cl. 33-125.00m.
Burrous, Merwyn L.; and Furby, Neal W., to Chevron Research Company. Poly(alkoxy) siloxane fluid composition containing a phenolic crystallization inhibitor. 3,732,169, Cl. 252-78.000.
Burrows, Frederick J., to Teledyne Mid-American Corporation. Container and cap combination to indicate tampering. 3,731,849, Cl. 222-153.000.
Burton, James C.: *See—*
Awe, Russell C.; Burton, James C.; and Blank, Thomas G., 3,731,732.
Burwell, Garwood N., to Rails Company, The. Adjustable fastener assembly for concrete ties. 3,731,875, Cl. 238-346.000.
Burwen, Richard S. Wide dynamic range noise masking compandor. 3,732,371, Cl. 179-1.00r.
Busbey, William F.; and Hopkins, Donald L., to Caterpiller Tractor Co. Summing valve arrangement. 3,732,036, Cl. 417-216.000.
Busch, Robert Edward, to RCA Corporation. Method for dicing materials having a hexagonal crystal structure. 3,731,861, Cl. 225-2.000.
Bustraan, Daniel J.; Gossie, Mijo A.; Sundstrom, Roy N.; and Wisner, William R., to Corning Glass Works. Article handling apparatus and method. 3,731,862, Cl. 225-4.000.
Butler, Joseph W., to Lear-Siegler, Inc. Fluid coupling. 3,731,705, Cl. 137-614.060.
Butler, Thomas J. Cupola structure. 3,731,910, Cl. 266-15.000.
Buttery, Kenneth T., to Brown Company. Compartmented ice cream carton with interior vertical support and divider, dual opening means and reclosure means. 3,731,870, Cl. 229-27.000.
Buttery, Kenneth T.; and Haas, Richard G., to Brown Company. Compartment front opening carton with interior vertical divider. 3,731,871, Cl. 229-27.000.
Bysouth, Peter Thomas; and Clarke, Robert William, to British Drug Houses Limited, The. 3-Cyclohexyl phenyl 2 hydroxypropyl 4 phenyl piperazines. 3,732,229, Cl. 260-268.0ph.
Cailley, Jean-Pierre, to Societe des Accumlateurs Fixes et de Trection (Societe Anonyme). Electrochemical cells comprising current collector member embedded into the protruding edges of the electrodes. 3,732,124, Cl. 136-13.000.
Cairelli, Carmen P., to McGill Manufacturing Company, Inc. Low cost switching arrangement for appliance motor speed control. 3,732,476, Cl. 318-305.000.
Caldwell, Jack N. Batting practice device. 3,731,925, Cl. 273-26.00e.
Caleener, Courtland C., to Wilson Certified Foods, Inc. Signal integrating, storing and analyzing circuit. 3,732,411, Cl. 235-183.000.
California Instruments Co.: *See—*
Christiansen, Robert A.; and Balasubramaniam, Dhanikodi, 3,732,507.
Callahan, George G., to Carrier Corporation. Modular multizone, zone logic control center. 3,731,730, Cl. 165-22.000.
Callum, George William, to Lamson Paragon Limited. Photo-composing machines. 3,732,009, Cl. 355-43.000.
Calton, Marion A.; and Weiss, Carl D., to Production Technology Inc., mesne. Friction welding sintered materials. 3,731,959, Cl. 287-189.36b.
Calvin, Noel M. Pulse producing circuit particularly adapted for button type telephone. 3,732,439, Cl. 307-284.000.
Cameron Iron Works, Inc.: *See—*
Allen, Herbert, 3,731,599.
Camp, Dennis W.: *See—*
Kaufman, John W.; Camp, Dennis W.; and Turner, Robert E., 3,731,531.
Campbell, Donald S., to Ecodyne Corporation. Salt platform seal arrangement. 3,732,165, Cl. 210-190.000.
Campbell, James A., to Westinghouse Air Brake Company. Brake rigging for railway car trucks. 3,731,766, Cl. 188-52.000.
Campbell Soup Company: *See—*
Berner, David L.; Jacobson, Glen A.; and Trombold, Charles D., 3,732,111.
Gageant, Louis M.; and Greet, William E., 3,731,715.
Campman, James P., to Vidar Laboratories, Inc. Transistor transmitter using variable line length tuner. 3,732,497, Cl. 325-105.000.
Canadian Patents and Development Limited: *See—*
Eapen, Kottikandathil; Tape, Norman Wilson; and Sims, Richard Paul Andrew, 3,732,108.
Canas-Rodriguez, Antonio; and Leeming, Peter Rodway, to Pfizer Inc. 3-Substituted-1-phenyl indolinones. 3,732,248, Cl. 260-325.000.
Candy, William R. Header-spoon with flexible trailing bait. 3,731,419, Cl. 43-42.280.
Cantella, Michael J.; and Stewich, Max W., to United States of America, Army, mesne. Spatial discrimination system for use with pulsed optical energy and television pick-up tubes. 3,731,892, Cl. 244-3.160.
Carabateas, Philip M., to Sterling Drug Inc. 1,2,3,10,11,11α-Hexahydro-5H-pyrrolo[2,1-c] [1,4]benzodiazepine-5,11-diones. 3,732,212, Cl. 260-239.30t.
Carbonell, Marlene. Bathtub scrubber. 3,731,334, Cl. 15-50.00r.
Carborundum Company, The: *See—*
Carpenter, James H., Jr.; and Nalley, Don B., 3,731,432.
Carlo Erba S.p.A.: *See—*
Lauria, Francesco; Vecchietti, Vittorio; Bergamaschi, Mario; and Tommasini, Raffaele, 3,732,308.
Carlson, Alton R.: *See—*
Brown, Duane; and Carlson, Alton R., 3,732,094.
Carlson, Duane G., to International Business Machines Corporation. Acoustic filter. 3,731,759, Cl. 181-.50f.

Carlson, Floyd E. Pump displacement control. 3,732,037, Cl. 417-217.000.

Carminati, Julien. Nut running machines. 3,731,362, Cl. 29-200.00p.

Carmon, Rodrigo: *See—*
Martinez, Cristobal; Fernandez, Miguel; and Carmon, Rodrigo, 3,732,235.

Carothers, Frank S., Jr., to General Motors Corporation. Fuel control valve. 3,732,039, Cl. 417-300.000.

Carpenter, James H., Jr.; and Nalley, Don B., to Carborundum Company, The. Centrifugal blasting apparatus for removing Wustite scale. 3,731,432, Cl. 51-9.000.

Carr, Harry A. Keeper accessory for various types of conventional tools. 3,731,722, Cl. 145-50.0da.

Carr, Norman L.; Roe, Warren A., Jr.; and Stauffer, Harry C., to Gulf Research & Development Company. Thermally efficient nonpolluting system for production of substitute natural gas. 3,732,085, Cl. 48-214.000.

Carrier Corporation: *See—*
Callahan, George G., 3,731,730.
Pilarczyk, Karol; and Pennink, Hans, 3,732,038.

Carrillo, Nelson P.; Snyder, David; and Husko, John P. Swimming pool alarm system. 3,732,556, Cl. 340-261.000.

Carroll, Albert W.: *See—*
Sizer, Phillip S.; and Carroll, Albert W., 3,731,742.

Carson, Don B., to Universal Oil Products Company. Apparatus for fluid-solid contacting operations. 3,732,081, Cl. 23-288.00s.

Carter, Clyde Thomas: *See—*
Henschen, Homer Ernst; and Carter, Clyde Thomas, 3,732,525.

Cartmell, James V.: *See—*
Churchill, Donald; Cartmell, James V.; and Miller, Robert E., 3,732,119.

Casey, Don E. Collapsible container liner. 3,731,854, Cl. 222-386.500.

Cassel, Carlis E.; and Currier, Robert F., to National-Standard Company. Wire reel apparatus. 3,731,888, Cl. 242-129.000.

Cassella Farbwerke Maimkur Aktiengesellschaft: *See—*
Beyerle, Rudi; Stachel, Adolf; Nitz, Rolf-Eberhard; Resag, Klaus; and Schraven, Eckhard, 3,732,251.

Castro, Albert J.: *See—*
Anderson, Frank R.; and Castro, Albert J., 3,731,649.

Castrucci, Paul P.: *See—*
Agusta, Benjamin; Bardell, Paul H.; Castrucci, Paul P.; Henle, Robert A.; and Pecorato, Raymond P., 3,731,375.

Caterpillar Tractor Company: *See—*
Brown, Larry A.; and McMichael, James W., 3,731,775.
Master, Ralph E.; Philipsen, Richard D.; Starr, Kenneth E.; and Unkrich, Herbert C., 3,731,515.
Moser, Raymond L.; and Moyer, Edward J., 3,731,720.

Caterpiller Tractor Co.: *See—*
Busbey, William F.; and Hopkins, Donald L., 3,732,036.

Caudill, Allison H.; and Goff, Willie, Jr., to International Business Machines. Ribbon supply cartridge. 3,731,781, Cl. 197-151.000.

Cavalleri, Bruno; and Sardi, Anna, to Gruppi Lepetit S.p.A. α-Halophenylacetamides. 3,732,253, Cl. 260-340.500.

Caveney, Jack Edward; Moody, Roy A.; and Bulanda, John Jean, to Panduit Corporation. Cable tie. 3,731,347, Cl. 24-16.0pb.

Cavraro, Antonio: *See—*
Stocchi, Virgilio; Cavraro, Antonio; Marghera, Porto; and Vio, Dario, 3,731,457.

Cecil, Richard R.; and Fink, Thomas E., to Esso Research and Engineering Company. Two-stage hydrodesulfurization process with hydrogen addition in the first stage. 3,732,155, Cl. 208-210.000.

Cenco Medical/Health Supply Corporation: *See—*
Spiegel, Ronald E., 3,731,684.

Cenker, Moses; and Kan, Peter T., to BASF Wyandotte Corporation. Carbodiimide foams of reduced brittleness prepared from resole-derived quasi-prepolymers. 3,732,187, Cl. 260-77.5bf.

Cesna, Joseph V.: *See—*
Boettcher, Stephen A.; Cesna, Joseph V.; and Dumentat, Raymond E., 3,731,435.

Chaboseau, Jacques Pierre: *See—*
Poulain, Jean Armand; and Chaboseau, Jacques Pierre, 3,731,486.

Champion International Corporation: *See—*
Hackley, Kenneth Lewis, 3,732,061.

Chatelon, Andre Edouard Joseph, to International Standard Electric Corporation. Time division multiplex coder. 3,732,376, Cl. 179-15.0by.

Chatterjee, Pronoy Kumar, to Personal Products Company. Fluid absorption and retention products and methods of making the same. 3,731,686, Cl. 128-285.000.

Chaumont, Robert Jean; and Bargeton, Gilbert Louis, to Societe dite: Societe Anonyme de Telecommunications. Process and apparatus for the regeneration of rectangular signals. 3,732,378, Cl. 179-16.0ea.

Chazen, Julius L.: *See—*
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Chen, Allen, to Lorton Laboratories, Ltd. Endotracheal tube and connector unit. 3,731,691, Cl. 128-351.000.

Chen, Ho-Sou; Kwei, Ti Kang; and Wang, Tsuey Tang, to Bell Telephone Laboratories, Incorporated. Process for simultaneously shearing and quenching polymer films. 3,732,349, Cl. 264-175.000.

Chen, Nai Yuen, to Mobil Oil Corporation. Selective sorption of less polar molecules with crystalline zeolites of high silica/alumina ratio. 3,732,326, Cl. 260-676.0ms.

Chen, Richard, to Polaroid Corporation. Temperature sensitive pressure-applying members for a photographic processing liquid. 3,732,099, Cl. 96-29.00r.

Chen, Yen-Sun, to Bell Telephone Laboratories, Incorporated. Beam index color television display device. 3,732,359, Cl. 178-5.40h.

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Chimura, Kazuya; Ito, Kazuo; Takashima, Shunichi; Shimoshinbara, Yoshihiro; and Shindo, Mizuo, to Mitsubishi Rayon Company Limited. Process for preparing linear polyesters. 3,732,182, Cl. 260-75.000.

Chivari, Ilie, to Fa. Volkan Kupplungs- u. Getriebau Bernhard Hackforth. Axial piston pump. 3,731,593, Cl. 91-487.000.

Chrisp, Billie R. Automatic chalkboard erasing apparatus. 3,731,335, Cl. 15-97.00r.

Christiansen, Robert A.; and Balasubramaniam, Dhanikodi, to California Instruments Co. AC power supply having computer controlled frequency and phase and amplitude. 3,732,507, Cl. 332-16.00r.

Chruchill, John P.; and Thompson, Tommy Lewis, to Life Support Inc. Welding and cutting unit. 3,732,060, Cl. 431-344.000.

Chrysler Corporation: *See—*
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Chugai Seiyaku Kabushiki Kaisha: *See—*
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Churchill, Donald; Cartmell, James V.; and Miller, Robert E., to National Cash Register Company, The. Temperature sensitive visual display device. 3,732,119, Cl. 117-1.700.

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Cicatelli, Rodolfo, to Autovox S.p.A. Signalling and controlling device for magnetic tape apparatus. 3,732,477, Cl. 318-463.000.

Cimperman, Fred J.: *See—*
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Clarke, Edwin E.; and Florig, Albert J., said Florig, Albert J. assor. to said Clarke, Edwin E. Bulk material handling system. 3,731,828, Cl. 214-305.000.

Clarke, James F.; and Deprez, Thomas A., to Gleason Works, The. Apparatus for grinding toothed faced members. 3,731,433, Cl. 51-34.00k.

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Continental Oil Company: *See—*
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Coon, Clifford L.; Hill, Marion E.; and Ross, Donald L., to United States of America, Navy, mesne. Difluoroamino compounds. 3,732,288, Cl. 260-486.00h.

Coon, James G. Harvester for headed vegetables. 3,731,477, Cl. 56-327.00r.

Cooper, Herbert Wayne. Tube fins of outwardly-organized materials. 3,731,738, Cl. 165-180.000.

Cooper, Richard Roy: *See—*
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Cope, Geoffrey Wilton; and Smith, Loren William. Dresser Industries, Inc. Double ended spring shock absorber. 3,731,914, Cl. 267-65.00r.

Copeland, Ben H. Competition bridge cards. 3,731,936, Cl. 273-149.00p.

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Cornish, George Kent; and Knollman, Melvin Louis, to Deere & Company. Self-leveling combine. 3,731,470, Cl. 56-10.400.

Corsaro, Vincent A.; and Smith, Norman F., to Western Electric Company, Incorporated. Methods for soldering by utilizing a solder bath having a thermal gradient. 3,732,063, Cl. 432-29.000.

Costarella, Nino F.; and Giuffre, Anthony A., to Nino's Inc. Air purification systems. 3,731,462, Cl. 55-228.000.

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Cotter, William L., 50% to Welland Investment Trust of Kenney, William F. and Reiss, Martin H. Coordinate digitizer system. 3,732,369, Cl. 178-18.000.

Courty, Albert, to Thomson-CSF. Ultrasonic flowmeter and method of metering. 3,731,532, Cl. 73-194.00a.

Cousin, Maurice Claude, to A. & M. Cousin et Cie, Etablissements Cousin Freres. Articulation for adjustment of inclination of a seat back rest especially for motor vehicle seats. 3,731,342, Cl. 16-144.000.

Coveney, Joseph Francis, to Union Carbide Corporation. Process of and apparatus for air separation with nitrogen quenched power turbine. 3,731,495, Cl. 62-39.000.

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Cramer, Bernhard; Singen, Heinrich Deimling; and Hauf, Rudi, to International Standard Electric Corporation. Punched card reader with a drum-shaped, rotatable card magazine. 3,732,400, Cl. 235-61.11b.

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Cripe, Gordon L., to Knudsen, Morrison, Company, Inc. Motor grader with device for guiding vehicle along a pair of parallel rails. 3,731,410, Cl. 37-104.000.

Crivello, James V.; and Seidenspinner, Ann L., to General Electric Company. Method for making polyimides and products produced thereby. 3,732,189, Cl. 260-78.0va.

Crooks, Richard S. Miter box. 3,731,572, Cl. 83-471.003.

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Cupertino, Calif., to GTE Sylvania Incorporated. Log periodic antenna with foreshortened dipoles. 3,732,572, Cl. 255-6-2--25.

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Davis, Arlyn W. Camper-bumper compartment and step. 3,731,860, Cl. 224-42.060.
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Davis, Dalton M., to Pyramid Enterprises, Inc. Hubcap for a vehicle wheel assembly. 3,731,978, Cl. 301-108.0sc.
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Gageant, Louis M.; and Greet, William E., to Campbell Soup Company. Volumetric filling apparatus. 3,731,715, Cl. 141-107.000.
Galiano, Francis R.: *See—*
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Gann, Bernard M.: *See—*
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Garcea, Giampaolo, to Alfa Romeo S.p.A. Internal combustion engine, more particularly for motor vehicles, and means for limiting the emmission of unburned cases and of volatile fuel. 3,731,665, Cl. 123-136.000.
Garnish, Edward William; Saffron, Walden; and Haskins, Clifford George, to Ciba-Geigy AG. Polyepoxide-polymercaptan-amine adducts. 3,732,309, Cl. 260-583.00p.
Garrod, Norman John. Packaging gramophone records. 3,731,794, Cl. 206-62.00p.
Gates, Robert L., to Singer Company, The. Gyroscopic boresight alignment system and apparatus. 3,731,543, Cl. 73-504.000.
Gedde, Erik, to American Can Company. Container end wall construction. 3,731,838, Cl. 220-67.000.
Geerling, Leonardus Johannes, to Tektronix, Inc. Motor control circuit. 3,732,475, Cl. 318-275.000.
Geery, Paul W., to Dresser Industries, Inc. Electrical generator having non-salient poles for metering shaft rotation of a turbine assembly. 3,731,533, Cl. 73-231.00r.
Geiger, Roy J.: *See—*
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Gendrich, James A. Leveler for paving machine. 3,732,024, Cl. 94-45.000.
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Geoffray, Marcel. Process and apparatus for the taking of photographs in relief. 3,731,606, Cl. 95-18.00p.

George, Howard Edward; and Guertin, Jean Marie, to Amsted Industries Incorporated. Apparatus for making brake shoes. 3,732,045, Cl. 425-117.000.

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Gerber, Heinz Joseph; and Pearl, David Raymand, to Gerber Garment Technology, Inc. Device for applying substance to a sheet of material. 3,731,648, Cl. 118-6.000.

Gerd, Hoelzle, and; and Ulrich, Paul, to Ciba-Geigy AG. Quaternary substituted triazines. 3,732,218, Cl. 260-248.0ns.

Geul, Herman Robert, to Sun Electric Corporation, mesne. Electric fuel injection tester. 3,732,492, Cl. 324-103.00p.

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Glancy, John J. Orthotic-prosthetic transverse rotator. 3,731,323, Cl. 3-2.000.

Glanzmann, Werner; and Zaugg, Roland, to Schild, A., S.A. Device for fastening a dial to a watch movement. 3,731,482, Cl. 58-127.00b.

Glass, Ercell L., to Cone, J. L., Jr., Cone, C. W. and Cone, Douglas P. Apparatus for removing cured concrete articles from pallets. 3,732,053, Cl. 425-289.000.

Glass, Marvin, & Associates: *See—*
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Glenn, Raymond D. Floating pier with self adjusting stairway assembly. 3,731,761, Cl. 182-1.000.

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Godwin, Gilbert Alan; and Pratt, Chapin A., to Howe Richardson Scale Company. Electrical weighing systems. 3,731,754, Cl. 177-165.000.

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Goodacre, Cecil, to Lansing Bagnall Limited. Differential gear mechanisms. 3,731,552, Cl. 74-393.000.

Goodnight, Hershel; Zink, John S.; and Reed, Robert D., to Zink, John, Company. Burner for gaseous fuels in reduced oxygen and/or significant velocity atmosphere. 3,732,059, Cl. 431-286.000.

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Gottfried, Herbert. Continuous freeze dryer. 3,731,392, Cl. 34-3.000.

Gould, Douglas Eugene: *See—*
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Graafmans, Hans, to Technicolor, Inc. Remote focusing assembly. 3,731,998, Cl. 352-140.000.

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Grayson, Bobby W., to Sellers and Brace. Non-stretching explosive cord. 3,731,626, Cl. 102-27.00r.

Greene, Oscar; deceased (by Pelz, Robert L.; and Greene, Robert S.; executors). Theft-preventive attachment for locks. 3,731,506, Cl. 70-97.000.

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Gregor, Vaughn. Modular distributor system for bulk material. 3,731,787, Cl. 198-82.000.

Griesser, Otto, to International Standard Electric Corporation. Apparatus for marking insulated electrical conductors. 3,731,655, Cl. 118-624.000.

Griffin, Lucy E. Music teaching aid. 3,731,581, Cl. 84-471.000.

Griffin, Nicholas E. Disposable container. 3,731,869, Cl. 229-22.000.

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Grutsch, James F.; and Mallatt, Russell C., to Standard Oil Company. Method for removing oil and debris from water. 3,732,161, Cl. 210-30.000.

GTE Automatic Electric Laboratories, Incorporated: *See—*
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Guarrasi, Joseph S. Portable hair wash sink attachment. 3,731,325, Cl. 4-159.000.

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Guerga, Michel Henri; and Hallier, Bernard Lucien Desire, to International Standard Electric Corporation. Apparatus for casting of ceramics. 3,732,048, Cl. 425-174.400.

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Gullickson, Cecil F. Sight and sound teaching aid for keyboard instruments. 3,731,582, Cl. 84-478.000.

Gunia, Klaus, to Friedr. Remy Nachfolger GmbH. Apparatus for the continuous manufacture of precast reinforced concrete products, particularly slabs and beams. 3,732,052, Cl. 425-219.000.

Guptill, Frank E., Jr.: *See*—
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Gurinsky, David H.: *See*—
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Gustavsson, Karl Axel Goran, to Aktiebolaget Bahco Ventilation. Apparatus for adjusting the concentration of a circulating liquid suspension to a determined, constant value. 3,731,811, Cl. 210-194.000.

Gutman, Arnold D.; and Baker, Don R., to Stauffer Chemical Company. Certain oxime esters and their use as acaricides and in controlling fungi and bacteria. 3,732,306, Cl. 260-566.0ae.

Haagensen, Darrow E.: *See*—
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Habermann, Helmet. Magnetic bearing block device for supporting a vertical shaft adapted for rotating at high speed. 3,731,984, Cl. 308-10.000.

Hackley, Kenneth Lewis, to Champion International Corporation. Reinforced page and method of printing on same. 3,732,061, Cl. 432-10.000.

Hackney, Seth L. Glass washing apparatus. 3,731,696, Cl. 134-80.000.

Haede, Werner: *See*—
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Haggar Company: *See*—
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Hajec, Chester S. Golf cart and control therefore. 3,731,756, Cl. 180-6.500.

Haley, David M.; and Bergantzel, Richard P., to Allen Electric and Equipment Company. High speed overhead car wash apparatus. 3,731,331, Cl. 15-21.00d.

Hall, Lewis William, to Maple Press Company, The. Book nipping apparatus. 3,731,617, Cl. 100-215.000.

Hall, Richard L.; and Miller, Carl F., to Westinghouse Electric Corporation. Printed circuit board manual assembly director device. 3,731,363, Cl. 29-203.00b.

Hallier, Bernard Lucien Desire: *See*—
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Halloran, William X. Self-retaining muscle retractor. 3,731,673, Cl. 128-20.000.

Hallum, Charles E., to Philco-Ford Corporation. Supersonic power amplifiers. 3,731,699, Cl. 137-81.500.

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Hambrick, Lester N., to Trakwork Equipment Company. Rail pulling apparatus. 3,731,635, Cl. 104-1.00r.

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Hammes, Josef J., to Lowe Manufacturing Company. High security loud speaker baffle. 3,731,760, Cl. 181-31.00b.

Hamon, Maurice, to Societe Hamon Sobelco S.A. Drift eliminators for atomospheric cooling tower. 3,731,461, Cl. 55-222.000.

Handel, Plessey, und Investments A.G.: *See*—
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Hanley, William J. Panel structure and the like with connecting means. 3,731,956, Cl. 287-20.926.

Hanny, John F.: *See*—
Herbig, James A.; and Hanny, John F., 3,732,172.

Hansard, Cyril. Apparatus for controlling the exposure of light sensitive material. 3,732,011, Cl. 355-68.000.

Hansen, Niels S., to Foundation and Bridge Corporation. Pusher device. 3,731,637, Cl. 104-172.00b.

Hanson, Fred H.: *See*—
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Harden, Phillip L.; and Thomas, Samuel M., Jr., to Bowmar Instrument Corporation. Rotatable indicator having light-emitting diode backlighting. 3,732,560, Cl. 340-373.000.

Hardway, Edward V., Jr., to Spearhead, Inc. Capacitive pick-off transducer. 3,732,553, Cl. 340-200.000.

Hargest, Thomas S.: *See*—
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Hari, Stefan, to Ciba-Geigy A.G. Benzoquinone ethers and process for their manufacture. 3,732,259, Cl. 260-396.00r.

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Harke, Cyril J.; Parkinson, John C.; and Currey, John E., to Hooker Chemical Corporation. Electrochemical apparatus and process for the manufacture of halates. 3,732,153, Cl. 204-95.000.

Harna, Hyacint E.; and Merrell, Richard G., to Zenith Radio Corporation. Inhibitable random pulse generator. 3,732,355, Cl. 178-5.100.

Harper, Ingeborg T.: *See*—
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Harrison, Alwin: *See*—
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Harrison, William J. Automatic lens focusing method and apparatus. 3,732,001, Cl. 353-101.000.

Harter, James E.; and Morse, John E., to Eastman Kodak Company. Paper advance and marking mechanisms for photographic printing apparatus. 3,732,010, Cl. 355-64.000.

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Hartmann, M. W., Manufacturing Co., Inc.: *See*—
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Hartwell, Ronald Groff; and Miller, Arley Keener, to AMP Incorporated. Multiple socket terminal strip for terminal junction module. 3,732,522, Cl. 339-19.000.

Harwood, Leopold Albert, to RCA Corporation. Automatic chroma control circuits. 3,732,358, Cl. 178-5.4ac.

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Hatano, Isao; Nagano, Akira; and Koya, Kiyoshi, to Omron Tateisi Electronics Co. Digital display system. 3,732,545, Cl. 340-172.500.

Hatfield, Thomas J.; and Robertson, Gus C. Rotary engine apparatus. 3,731,661, Cl. 123-43.00c.

Hauenstine, Edgar F.; and Puerner, George O., to Mallory, P. R., & Co., Inc. Mounting means and slideable electrical contact for linear potentiometer. 3,732,521, Cl. 338-202.000.

Hauf, Rudi: *See*—
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Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., to Squibb, E. R., & Sons, Inc. Imidazole derivatives. 3,732,215, Cl. 260-243.00r.

Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., to Squibb, E. R., & Sons, Inc. Thiazolo(3,4-a) benzimidazole derivatives and process. 3,732,240, Cl. 260-306.700.

Haupt, Walter, to Farbenfabriken Bayer Aktiengesellschaft. Bistable storage element with magnetic data storage. 3,732,550, Cl. 340-174.0zb.

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Haury, Vernon E.; and Frankel, Milton B., to North American Rockwell Corporation. Gun propellant containing nitroplasticized nitrocellulose and triaminoguanidine. 3,732,131, Cl. 149-18.000.

Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Unitary core for molding a nasal cannula. 3,731,900, Cl. 249-177.000.

Hawke, David L., to N.L. Industries, Inc. Anodized magnesium and magnesium alloys. 3,732,152, Cl. 204-56.00m.

Hawkins, Jerry D.; and Keinanen, Henry J., to Continental Can Company, Inc. Easy opening container. 3,731,835, Cl. 220-53.000.

Hayashi, Kazuo, to Kabushiki Kaisha Morita Seisakusho. Dental chair. 3,731,383, Cl. 32-22.000.

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Heimburger, Norbert, to Behringwerke Aktiengesellschaft. Process for the isolation of native, highly purified plasminogen. 3,732,146, Cl. 195-66.00b.

Heine, Hans-Georg; Rudolph, Hans; and Kreuder, Hans-Joachim, to Bayer Aktiengesellschaft. α-Methylol-benzoin-sulphonic acid esters. 3,732,273, Cl. 260-456.00r.

Hellerbach, Joseph; and Walser, Armi, to Hoffmann-La Roche Inc. 1-Acyloxyether-1,4-benzodiazepin-2-ones and methods for their preparation. 3,732,211, Cl. 260-239.30d.

Helsley, Grover C.; Lunsford, Carl D.; and Richman, John A., Jr., to Robins, A. H., Company, Incorporated. 3-Di-substituted methylene pyrrolidines wherein the 1- or N-lower-alkyl substituent contains at least two carbon atoms. 3,732,246, Cl. 260-326.800.

Hendrickson, Kenneth E.; and Mattson, Larry F., to International Business Machines Corporation. Open loop steeping motor acceleration-deceleration control. 3,732,480, Cl. 318-696.000.

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Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Trioleфinic aliphatic nitriles. 3,732,282, Cl. 260-465.900.

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Hibma, James, 1/2 to Hibma, Anne Marie. Scaffold drive and steering unit. 3,731,758, Cl. 180-11.000.

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Berner, David L.; Jacobson, Glen A.; and Trombold, Charles D., 3,732,111.

Jacoby, Hans-Dieter, to Continental Elektroindustrie Aktiengesellschaft. Gravimeter. 3,731,538, Cl. 73-382.000.

Jahnke, Earl M.; and Miller, Robert. Safety guard for fabricating apparatus. 3,731,573, Cl. 83-544.000.

James, William S. Liquid separator. 3,731,802, Cl. 210-71.000.

Jaquay, Louis H., to Dravo Corporation. Method and apparatus for heat treating agglomerates. 3,732,064, Cl. 263-32.00r.

Jaroff, David: *See—*
Litt, Donald; Jaroff, David; and Shamir, Amos, 3,731,688.

Jaworski, Eugene: *See—*
Breslow, Jeffrey D.; and Jaworski, Eugene, 3,731,932.

Jeandron, Howard T. Projectile and target having a resilient frictional resistant surface causing an impinging projectile to bounce back toward the projector. 3,731,930, Cl. 273-95.00r.

Jeddeloh Bros. Sweed Mills, Inc.: *See—*
Larson, Charles L., 3,731,918.

Jennings, Irving C. Gas and liquid separator. 3,731,467, Cl. 55-459.000.

Jenoptik Jena G.m.b.H.: *See—*
Feist, Wieland; and Von Chamier, Busso, 3,732,015.

Jenssen, Sverre Knut, to Alfa-Laval AB. Plate heat exchanger. 3,731,737, Cl. 165-167.000.

Jewers, Kenneth; and King, Terence Albert, to Solicitor for the Affairs of Her Majesty's Treasury, The, mesne. Process for extracting oleanolic acid-3-diglucoside and products obtained therefrom. 3,732,202, Cl. 260-210.00r.

Johnson & Johnson: *See—*
Fechillas, Michael R., 3,732,139.

Johnson Die & Engineering Co.: *See—*
Johnson, Verner A., 3,731,369.

Johnson, Frederick Stanley, 1/3 to Consolidated Concrete Limited and 1/3 to Welch, Herbert T. Slump meters for mobile concrete mixers. 3,731,909, Cl. 259-177.000.

Johnson, Lawrence N. Boat cradle for mobile trailers. 3,731,826, Cl. 214-84.000.

Johnson, Oliver C.: *See—*
Toma, Joseph R.; Johnson, Oliver C.; Mitreuter, Amelia M.; and Ward, Charles C., 3,731,378.

Johnson, Ralph S. Safety ski binding apparatus. 3,731,945, Cl. 280-11.35t.

Johnson, Richard N., to United States of America, Army. Manufacturing an optical shaft encoder having a holographic code disk. 3,731,373, Cl. 29-592.000.

Johnson, Robert G.; and McClure, Benjamin T., to Honeywell Inc. Wide angle ultraviolet radiation detector. 3,732,453, Cl. 313-100.000.

Johnson, S. C., & Son, Inc.: *See—*
Vos, Kenneth D., 3,731,855.

Johnson, Verner A., to Johnson Die & Engineering Co. Method and apparatus for forming and setting rivets integral with a layer. 3,731,369, Cl. 29-509.000.

Johnson, William H., to Patent and Development of North Carolina, Inc. Method of fabricating a fluid despersion nozzle. 3,731,517, Cl. 72-367.000.

Johnston, Richard W., to General Motors Corporation. Inverter commuting capacitor charge control circuit. 3,732,473, Cl. 318-227.000.

Jones, Allen P.: *See—*
Pepmeier, Carl R.; Burke, David C.; and Jones, Allen P., 3,731,529.

Jones, Charles L., to Ripley Company, Inc. Meter device. 3,732,404, Cl. 235-113.000.

Jones, Thomas E.: *See—*
Burke, William F.; Greenwood, Robert C.; and Jones, Thomas E., 3,731,777.

Joosse, Cornelis G., to Shell Oil Company. Method and apparatus for drilling offshore wells. 3,732,143, Cl. 175-6.000.

Judge, Raymond Frank Aspinall; Martin, Frederick Royal; and Mozley, Russell George, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for the Environment in Her Britannic Majesty's Government of the. Preformed surfacing for pavemets. 3,732,020, Cl. 94-33.000.

Julian, Elmo C.: *See—*
Merrow, Raymond T.; Julian, Elmo C.; Eldridge, Judson B.; Rice, George B.; Dow, Robert L.; Rodgers, Charley R.; and Stull, Bertram O., 3,732,132.

Jungreis, Sidney W. Method of isotonic exercise. 3,731,922, Cl. 272-81.000.

Jureit, John Calvin, to Automated Building Components, Inc. Connector plate. 3,731,583, Cl. 85-13.000.

Jury, Webster W.: *See—*
Esser, George William; and Jury, Webster W., 3,731,790.

Jusim, Lev Veniaminovich: *See—*
Ageev, Georgy Sergeevich; Kuptsov, Ivan Pavlovich; and Jusim, Lev Veniaminovich, 3,731,492.

Just, Franklin H.: *See—*
Brunson, Glenn S.; Curran, Robert N.; and Just, Franklin H., 3,732,422.

Justice, James Robert, to Headway Company, The. Highway sign system. 3,732,558, Cl. 340-330.000.

JWI Ltd.: *See—*
Beacom, Oliver J.; and MacBean, Donald G., 3,732,142.

Kabel- und Metallwerke Gutenhoffnungshutte Aktiengesellschaft: *See-*
Dohmann, Fritz; Gulden, Karl; and Lehner, Willy, 3,731,516.

Kabushiki Kaisha Hattori Tokeiten: *See—*
Oishi, Masaaki; Takahashi, Yoshinaga; and Yoshizawa, Keiichi, 3,732,449.

Kabushiki Kaisha Morita Seisakusho: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
Kurita, Hirohisa, 3,731,480.
Tsuruishi, Yuki, 3,731,474.

Kaelin, George R.; and Platt, David M., to Litton Systems, Inc. Touch entry switch array. 3,732,389, Cl. 200-167.00a.

Kaiser, Wilhelm; Meurer, Wolfgang; and Muller, Georg, to Werke, Jagenberg, AG. Infinitely variable transmission. 3,731,549, Cl. 74-230.17a.

Kalimar, Inc.: *See—*
Kitagawa, Keisuke, 3,731,605.

Kalium Chemicals Limited: *See—*
Schad, Charles A., 3,731,752.

Kalle Aktiengesellschaft: *See—*
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Klupfel, Kurt-Walter; Steppan, Hartmut; and Maar, Herbert, 3,732,105.
Lind, Erwin, 3,732,418.

Steppan, Hartmut; Maar, Herbert; and Klupfel, Kurt-Walter, 3,732,106.

Kamlukin, Igor, to Simplicity Manufacturing Company, Inc. Rotary mower spindle brake. 3,731,472, Cl. 56-11.300.

Kamlukin, Igor; and Konyha, Peter P., to Simplicity Manufacturing Company, Inc. Planetary transmission. 3,731,557, Cl. 74-792.000.

Kampjes, Gerrit Richard; and Wilson, Ronald Ian, to Sherritt Gordon Mines Limited. Control of sensity of thickener underflow slurry. 3,731,804, Cl. 210-83.000.

Kan, Peter T.: *See*—
Cenker, Moses; and Kan, Peter T., 3,732,187.

Kaneko, Tamaki; and Mizuno, Katsumi, to Ricoh Co., Ltd. Etching solution application device for offset printing machines. 3,731,624, Cl. 101-142.000.

Kapp, Ernst: *See*—
Rudolph, Paul; and Kapp, Ernst, 3,731,485.

Kapperman, Dorothy M.: *See*—
Kipple, Harry P.; Cozzarin, Virgil J.; and Kapperman, Francis C., 3,732,066.

Kapperman, Francis C.: *See*—
Kipple, Harry P.; Cozzarin, Virgil J.; and Kapperman, Francis C., 3,732,066.

Karady, Sandor: *See*—
Sletzinger, Meyer; Karady, Sandor; Ly, Manuel G.; and Pines, Seemon H., 3,732,301.

Karel, Marcus: *See*—
Frankenfeld, John W.; Karel, Marcus; and Labuza, Theodore P., 3,732,112.

Karwinski, Gerhard E., to CTR, Inc. Grinding machine. 3,731,434, Cl. 51-95.01h.

Kase, Horoshi: *See*—
Nakayama, Kiyoshi; and Kase, Horoshi, 3,732,144.

Kaspaul, Alfred F.; and Kaspaul, Erika E., to Hughes Aircraft Company. High contrast image development apparatus. 3,732,012, Cl. 355-133.000.

Kaspaul, Erika E.: *See*—
Kaspaul, Alfred F.; and Kaspaul, Erika E., 3,732,012.

Kassarjian, John R., to Marathon Oil Company. Flow redistributor for a fixed bed down flow reactor. 3,732,078, Cl. 23-288.00r.

Kato, Fumio: *See*—
Okada, Katsuto; and Kato, Fumio, 3,731,393.

Katsumata, Mitsuo, to Kokusan Denki Co., Ltd. Magnet-type AC generator for a breakerless-type ignition system. 3,732,483, Cl. 322-91.000.

Kaufman, John W.; Camp, Dennis W.; and Turner, Robert E., to United States of America, National Aeronautics and Space Administration. Maxometers (peak wind speed anemometers). 3,731,531, Cl. 73-189.000.

Kawaguchi, Takeo; Saito, Reiji; Watanabe, Sanpei; and Suzuki, Yoshitaka, to Toagosei Chemical Industry Co., Ltd. Process for the production of chloroethylenes. 3,732,322, Cl. 260-654.00d.

Kayatz, Karl-Heinz; and Schreiner, Paul, to Fuller Company. Cement clinker cooler. 3,731,397, Cl. 34-164.000.

Kazansky, Vasily Leonidovich: *See*—
Nekrasov, Nikolai Nikolaevich; Kazansky, Vasily Leonidovich; Kirichenko, Sergei Pavlovich; Tsyganov, Nikolai Nikolai Nikifovich; and Sergeichev, Alexei Alexandrovich, 3,731,877.

Keinanen, Henry J.: *See*—
Hawkins, Jerry D.; and Keinanen, Henry J., 3,731,835.

Kekete, Sandor: *See*—
Benedek, Miklos; Irsai, Tamas; Kekete, Sandor; Ambrus, Sandor; and Savolyi, Istvan, 3,731,977.

Keller, Paul: *See*—
Meloni, Mario; and Keller, Paul, 3,731,799.

Kelly, James J. Dental cleaning apparatus. 3,731,675, Cl. 128-62.00a.

Kemptener Maschinenfabrik GmbH: *See*—
Wittki, Harry; and Weinmuller, Ludwig, 3,731,642.

Kendall Company, The: *See*—
Schaar, Charles H., 3,731,689.

Kennedy, Carl D.: *See*—
McGuire, Stephen E.; and Kennedy, Carl D., 3,732,324.

Kephart, John W., Jr. Structural panel. 3,731,449, Cl. 52-631.000.

Kermode, Harold L., to General Motors Corporation. Valve assembly for exhaust system. 3,731,973, Cl. 298-1.00h.

Kernodle, Bruce H.: *See*—
United States of America, National Aeronautics and Space Administration, 3,732,397.

Keto, Autust I.; and Astleford, John J., Jr., to Westinghouse Electric Corporation. Protective fuse. 3,732,517, Cl. 337-278.000.

Ketterer, Dieter: *See*—
Moller, Tilo; and Ketterer, Dieter, 3,731,417.

Kettler, Clarence J., to General Electric Company. Electrical apparatus having inverse parallel connected pairs of thyristors. 3,732,485, Cl. 323-43.50s.

Kiernan, Philip: *See*—
Aasen, Torulf F.; Kiernan, Philip; and Mogil, Bernard, 3,731,611.

Kierstead, Richard Wightman: *See*—
Fahrenholtz, Kenneth Earl; and Kierstead, Richard Wightman, 3,732,209.

Kiko, Uenoyama, Co., Ltd.: *See*—
Watanabe, Gentaro, 3,731,395.

Kilpert, Richard: *See*—
Bauer, Richard H.; and Kilpert, Richard, 3,731,710.

Kim, Dong H.: *See*—
Santilli, Arthur A.; and Kim, Dong H., 3,732,226.

Kim, Dong H.; and Santilli, Arthur A., to American Home Products Corporation. 4-[(Cyanomethyl)alkylamino]-2-phenyl-5-pyrimidinocarboxylic acids alkyl esters. 3,732,227, Cl. 260-256.40n.

Kimball, Robert L. Sample and hold remote control for FM tape decks. 3,732,380, Cl. 179-100.20b.

Kincaid, William C. Tee setting accessory for a golf shoe. 3,731,405, Cl. 36-2.5ah.

Kindermann, Wilfred Julius; and Knab, Emil David, to Bell Telephone Laboratories, Incorporated. Method and apparatus for bending an elongated object. 3,731,513, Cl. 72-295.000.

King, Bernard. Tape measuring device. 3,731,389, Cl. 33-189.000.

King, Terence Albert: *See*—
Jewers, Kenneth; and King, Terence Albert, 3,732,202.

Kingston Conveyors Limited: *See*—
Osborne, Michael Bryon, 3,731,784.

Kipple, Harry P.; Cozzarin, Virgil J.; and Kapperman, Francis C.; deceased (by Kapperman, Dorothy M.; administratrix), to Westinghouse Electric Corporation. Oven for controlling heating and curing of resinous insulating material. 3,732,066, Cl. 263-2.00r.

Kircher, Dieter: *See*—
Fink, Werner; Kircher, Dieter; and Mittelbach, Jutta, 3,731,980.

Kirichenko, Sergei Pavlovich: *See*—
Nekrasov, Nikolai Nikolaevich; Kazansky, Vasily Leonidovich; Kirichenko, Sergei Pavlovich; Tsyganov, Nikolai Nikolai Nikifovich; and Sergeichev, Alexei Alexandrovich, 3,731,877.

Kirk, Merritt C., Jr.: *See*—
Mills, Ivor W.; Kirk, Merritt C., Jr.; and Olenzak, Albert T., 3,732,154.

Kirsch, Albert, to Instant Brick Enterprise, Inc., mesne. Stencil device with means to clean. 3,731,654, Cl. 118-504.000.

Kishel, Joseph F.: *See*—
Tanguy, Denis R.; and Kishel, Joseph F., 3,731,530.

Kitagawa, Keisuke, to Kalimar, Inc. Electronic flash adapter for percussion-ignitable flash cameras. 3,731,605, Cl. 95-11.00r.

Kitagawa, Sadao, to Mitsubishi Petrochemical Company Limited. Production of α-olefin polymers. 3,732,197, Cl. 260-93.700.

Kitchin, Oscar G., to General Motors Corporation. One way roller clutch with resilient retainer. 3,731,774, Cl. 192-45.000.

Kiyoshi, Sandow, to Plasteco, Inc. Heat and smoke vent. 3,731,442, Cl. 52-232.000.

Klamer, Reuben B.; d/b/a Klamer, Reuben, & Associates: *See*—
Grant, Perry J., 3,731,933.

Klein, Gerhart P., to Mallory, P. R., & Co., Inc. Method of making porous electrodes comprising freezing wet powder and sintering. 3,732,095, Cl. 75-211.000.

Klemmer, Paul J., to Appleton Machine Company. Hydraulic means for adjusting embossing cylinders in a rotary embosser. 3,731,620, Cl. 101-23.000.

Klepitko, Joachim. Panel-shaped catalytic element with fastening means. 3,732,080, Cl. 23-288.00f.

Klock, John W., to Research Corporation. Submerged filter-horizontal flow mode. 3,732,160, Cl. 210-14.000.

Klupfel, Kurt-Walter: *See*—
Steppan, Hartmut; Maar, Herbert; and Klupfel, Kurt-Walter, 3,732,106.

Klupfel, Kurt-Walter; Steppan, Hartmut; and Maar, Herbert, to Kalle Aktiengesellschaft. Light-sensitive copying compositions. 3,732,105, Cl. 96-115.00p.

Klymkiw, Walter: *See*—
Beckman, Orval E.; and Klymkiw, Walter, 3,732,498.

Knab, Emil David: *See*—
Kindermann, Wilfred Julius; and Knab, Emil David, 3,731,513.

Knapsack Aktiengesellschaft: *See*—
Muller, Fritz; Stendenbach, Karl-Heinz; Dany, Franz-Josef; Steidl, Dieter; Weizenkor, Horst Heinrich; and Forst, Willi, 3,731,882.

Knobloch, James O.; and Woollen, J. Michael, to Standard Oil Company. Trimellitic acid anhydride product recovery by steam stripping crude anhydride of total solids from pseudocumene oxidation effluent and continuous fractionation of stripped product. 3,72,257, Cl. 260-346.400.

Knollman, Melvin Louis: *See*—
Cornish, George Kent; and Knollman, Melvin Louis, 3,731,470.

Knox, Frank P., to Veeder Industries, Inc. Pulse generator. 3,732,431, Cl. 307-106.000.

Knudsen, Morrison, Company, Inc.: *See*—
Cripe, Gordon L., 3,731,410.

Kobayashi, Norio; and Sato, Akihiko, to Nippon Kogaku K.K. Mirror mechanism for a single-lens reflex camera. 3,731,609, Cl. 95-42.000.

Kobayashi, Tsuyoshi: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,732,285.

Kobe Steel Ltd.: *See*—
Arikawa, Masayasu; and Iio, Katsuro, 3,731,868.

Kobinata, Eiichi: *See*—
Sakabe, Masaya; Kobinata, Eiichi; and Takaoka, Masaru, 3,732,051.

Kocay, Witold R.; and Fillippeli, Mario L., Jr., to Monsanto Company. Process of manufacturing tightly woven acrylic fabric. 3,731,351, Cl. 28-76.00r.

Koch, Ernst; and Schoedel, Ulrich, to Rohm G.m.b.H. Graft copolymeric lubricating oil additives. 3,732,334, Cl. 260-875.000.

Koch, James Allen, to Deere & Company. Combined draft hook operating and draft sensing. 3,731,745, Cl. 172-7.000.

Kodama Limited: *See*—
Ogura, Haruo; Itoh, Tsuneo; Takayanagi, Hiroaki; Yamazaki, Yukio; and Takagi, Hiromu, 3,732,243.
Koenig, Martin F.; and Issa, Manuel; deceased (by Sheedy, Patrick T.; administrator), to Cutler-Hammer, Inc. Moisture seal and fire barrier for electrical bus duct. 3,732,353, Cl. 174-68.00b.
Koff, Fred W.: *See*—
Fuhrmann, Robert; Koff, Fred W.; and Pisanchyn, John, 3,732,303.
Kojima, Tsuneji. Abacus instruction device. 3,731,401, Cl. 35-33.000.
Kokusan Denki Co., Ltd.: *See*—
Katsumata, Mitsuo, 3,732,483.
Kolat, Robert S.; and Hudson, Raymond K., to Dow Chemical Company, The. Method of producing substantially dust free calcium chloride particulate. 3,732,082, Cl. 23-304.000.
Kolb, Gunter: *See*—
Balle, Gerhard; and Kolb, Gunter, 3,732,190.
Komazawa, Hiroyasu; and Matsuno, Osamu, to Polyplastics Co., Ltd. Method for the synthesis of trioxan. 3,732,252, Cl. 260-340.000.
Komizo, Hidemitsu: *See*—
Ito, Yukio; Komizo, Hidemitsu; Okamura, Takeshi; and Simizu, Yasusi, 3,732,508.
Kondur, Nicholas Jr., to Burroughs Corporation. Type drum assembly for an on-the-fly printer. 3,731,779, Cl. 197-18.000.
Konyha, Peter P.: *See*—
Kamlukin, Igor; and Konyha, Peter P., 3,731,557.
Konyves, Imre: *See*—
Fex, Hans Jacob; Hogberg, Knut Bertil; and Konyves, Imre, 3,732,260.
Koomey, Paul C.; Streb, Alan J.; Stivers, George S.; and Barker, Theodore R., III, to Global Marine, Inc., mesne. Acoustical underwater control apparatus. 3,732,534, Cl. 340-5.00r.
Koppe, Herbert; Zeile, Karl; and Traunecker, Werner, to Boehringer Ingelheim G.m.b.H. 1-(2'-cyano-phenoxy)-2-hydroxy-3-ethylamino-propane and salts thereof. 3,732,277, Cl. 260-465.00e.
Koppers Company, Inc.: *See*—
Dickie, John P.; Harju, Philip H.; and Kostishack, David, 3,732,097.
Tatterson, Benjamin F.; and Gidick, Ward F., 3,731,361.
Vietorisz, Joseph A., 3,732,070.
Kostishack, David: *See*—
Dickie, John P.; Harju, Philip H.; and Kostishack, David, 3,732,097.
Kostur, Robert E., to Comet Industries, Inc. Thermoforming apparatus. 3,732,047, Cl. 425-144.000.
Kotala, James R.: *See*—
Fouse, Samuel S.; and Kotala, James R., 3,732,523.
Kotera, Norio; and Suzuki, Yoshitsugu, to Sumitomo Chemical Company, Limited. Preparation of m-(beta-cyanoethoxy) benzoic acid and esters thereof. 3,732,279, Cl. 260-465.00d.
Kough, John K.; Martin, Otis M.; and Miller, Silas N., to Ditz-Crane. Building panel enclosures for valley and hip structures. 3,731,438, Cl. 52-13.000.
Kounosu, Makoto: *See*—
Okamoto, Miyoshi; Watanabe, Koji; Ashida, Keiichi; Toyohiko, Hikota; Mizuguchi, Shungi; and Kounosu, Makoto, 3,731,352.
Kovats, Leslie P., to Anheuser-Busch, Incorporated. Preparation of ether-ester starch derivative. 3,732,206, Cl. 260-233.500.
Kovats, Leslie P., to Anheuser-Busch, Incorporated. Preparation of dextrin and starch esters. 3,732,207, Cl. 260-233.500.
Koya, Kiyoshi: *See*—
Hatano, Isao; Nagano, Akira; and Koya, Kiyoshi, 3,732,545.
Krafft, Frederick G. Free abrasive machine. 3,731,436, Cl. 51-209.0dl.
Kraft, Wolfgang, to ITT Industries, Inc. Method of forming a low-ohmic contact to a semiconductor device. 3,731,372, Cl. 29-590.000.
Kraftco Corporation: *See*—
Berman, Lawrence U., 3,732,263.
Krahl, Alfred: *See*—
Wilkens, Gunther; Lehmler, Hansfriedrich; and Krahl, Alfred, 3,732,393.
Kreiensen, Kurt; and Hutter, Karl. Measuring device for determining the angular position of a cam. 3,731,386, Cl. 33-1.0pt.
Kreiskorte, Heinz, to Schenck, Carl, Maschinenfabrik GmbH. Valving mechanism for hydraulic storage means, especially for hydraulic testing apparatus. 3,731,592, Cl. 91-411.00a.
Kresse, Heinz, to Siemens Aktiengesellschaft. Implantable artificial heart with externally worn fluid pressure energy transmitter. 3,731,322, Cl. 3-1.000.
Kreuder, Hans-Joachim: *See*—
Heine, Hans-Georg; Rudolph, Hans; and Kreuder, Hans-Joachim, 3,732,273.
Krieger, Paul E., to Dow Chemical Company, The. Tetrahydro-as-triazine-3(2H)thiones. 3,732,219, Cl. 260-248.0as.
Kronholm, Tapio Kullervo: *See*—
Donner, Frederic Arno; and Kronholm, Tapio Kullervo, 3,731,627.
Krupke, Richard V. Unitary dual-wrench tool. 3,731,559, Cl. 81-3.00f.
Kucharczyk, Norbert: *See*—
Semonsky, Miroslav; and Kucharczyk, Norbert, 3,732,231.
Kuck, John H.; and McCord, William M., to United States of America, Navy. Pulse doppler fuze. 3,732,564, Cl. 343-7.0pf.
Kuehl, Donald K.; Nutter, Harry A.; and Smart, Raymond C., to United Aircraft Corporation. Reactor seal. 3,731,651, Cl. 118-49.500.
Kuhajek, Eugene J.; and Tibbitts, Gordon H., to Morton International, Inc. Composition and method for iron removal. 3,732,171, Cl. 252-105.000.
Kuhnen, Ludwig, to Chemische Werke Huls Aktiengesellschaft. Vinyl chloride emulsion polymer and copolymer compositions. 3,732,178, Cl. 260-23.0em.
Kulberg, Gerardus H.; and Muehllehner, Gerd. . 3,732,419, Cl. 250-71.50s.
Kunimoto, Wallace Y.; and Buller, Joseph S., to Santa Barbara Research Center. Cooling apparatus. 3,732,421, Cl. 250-83.00r.
Kuniyoshi, Ieji: *See*—
Nabeta, Saburo; Kuniyoshi, Ieji; and Inagaki, Masahiro, 3,732,255.
Kunsman, Chester E.; and Coleman, Richard L., to United States of America, Agriculture. Continuous flow multiple trap for low temperature reduced pressure gas chromatography. 3,731,466, Cl. 55-386.000.
Kupcikevicius, Vytautas, to Union Carbide Corporation. Stuffing method and apparatus. 3,731,346, Cl. 17-49.000.
Kuptsov, Ivan Pavlovich: *See*—
Ageev, Georgy Sergeevich; Kuptsov, Ivan Pavlovich; and Jusim, Lev Veniaminovich, 3,731,492.
Kuribayashi, Michio, to Nippon Electric Company, Limited. Paired signal transmission system utilizing quadrature modulation. 3,732,375, Cl. 179-15.0bt.
Kurimoto, Miksihi; Nomura, Kenji; and Onouchi, Hiromichi, to Toyoda Koki Kabushiki Kaisha. Rest apparatus for preventing bending of a workpiece. 3,731,566, Cl. 82-38.00r.
Kurita, Hirohisa, to Kabushiki Kaisha Suwa Seikosha. Watch pallet lever having integral projection determining swing. 3,731,480, Cl. 58-116.00r.
Kushima, Teizo; Tanaka, Susumu; and Seino, Kuniki, to Minolta Camera Kabushiki Kaisha. Method and device for instant recording of light images while observing said light images. 3,732,007, Cl. 355-17.000.
Kutzer, Hans-Joachim, to Didier-Werke A.G. Containers with sliding valve for liquid smelt. 3,731,912, Cl. 266-38.000.
Kwei, Ti Kang: *See*—
Chen, Ho-Sou; Kwei, Ti Kang; and Wang, Tsuey Tang, 3,732,349.
Kyowa Hakko Kogyo Co., Ltd.: *See*—
Nakayama, Kiyoshi; and Kase, Horoshi, 3,732,144.
Kyte, Derek J., to Linotype-Paul Limited. Electro-optical printer with variable spacing and width controls. 3,731,610, Cl. 95-4.500.
Kyushin Soiyaku Kabushiki Kaisha: *See*—
Ishizaka, Otoharu, 3,732,249.
Kyvsgaard, Erik Bach; and Simonsgaard, Christian Peter, to Polystan ved E. Kyvsgaard. Temperature control means for blood and the like fluids. 3,731,731, Cl. 165-46.000.
La Cellophane: *See*—
Deshayes, Philippe-Marie; and Weber, Guy Paul, 3,732,016.
La Force, Jean; and Stringer, Carl. Method of solid phase welding for pipes. 3,732,391, Cl. 219-67.000.
La Grange, Lee D.: *See*—
Weitzel, William H.; and La Grange, Lee D., 3,731,850.
La Salle, Paul, to Eugins Matra. Apparatus for the production of orthophotoplans. 3,732,008, Cl. 355-22.000.
La Telemccanique Electrique: *See*—
Mongredien, Emile R., 3,731,561.
Laboratories Made, S.A.: *See*—
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McGuire, Stephen E.; and Kennedy, Carl D., to Continental Oil Company. Process for producing oil-soluble sulfonate feedstock. 3,732,324, Cl. 260-671.00g.

McIntosh, Duane E., to General Motors Corporation. Heart monitoring apparatus for a motor vehicle. 3,731,672, Cl. 128-2.06a.

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National Aeronautics and
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Newell, George F., to Westinghouse Electric Corporation. System for correcting for doppler shift frequency error of transmitted signals. 3,732,381, Cl. 179-100.20k.

Nicholas, Paul P., to Goodrich, B. F., Company, The. Vulcanization of halogen containing elastomers with thialkanoic acids and their salts and uncured and cured products thereof. 3,732,174, Cl. 260-2.00a.

Nicholas, Paul P., to Goodrich, B. F., Company, The. Polythiol vulcanization of epihalohydrin elastomers. 3,732,191, Cl. 260-79.000.

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Niki, Akiri; Hirose, Satoshi; and Ohara, Jiro, to Nagoya Kiko Co., Ltd. Rectilinear motion device for a mechanical handling machine. 3,731,820, Cl. 214-1.0bb.

Nilsson, Lars Gunnar: *See—*
Berle, Axel Gunnar; Nilsson, Lars Gunnar; and Olofsson, Hans Kristoffer, 3,731,707.

Nilsson, Sven Walter, to SKF Industrial Trading and Development Company N.V. Ball nut assembly. 3,731,553, Cl. 74-459.000.

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Nippon Electric Company, Limited: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Ono, Shigeo; and Hamaguchi, Ichiro, 3,731,603.
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Nippon Piston Ring Kabushiki Kaisha: *See—*
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Toshida, Shunichi; and Ozora, Takashi, 3,731,772.

Nitta, Tsuneharu; Taki, Hiromitsu; and Nagase, Kaneomi, to Matsushita Electric Industrial Co., Ltd. Dielectric ceramic composition comprising lead-lanthanum titanate solid solution. 3,732,117, Cl. 106-39.00r.

Nitz, Rolf-Eberhard: *See*—
Beyerle, Rudi; Stachel, Adolf; Nitz, Rolf-Eberhard; Resag, Klaus; and Schraven, Eckhard, 3,732,251.

Nix, Donald F.: *See*—
Glass, Marvin I.; Morrison, Howard J.; and Nix, Donald F., 3,731,428.

Nixon, James; and Beerbower, Alan, to Esso Research and Engineering Company. Emulsified carbon fuel. 3,732,084, Cl. 44-51.000.

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Hawke, David L., 3,732,152.
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Nomura, Kenji: *See*—
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Noordhoff, Franciscus: *See*—
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Nordquist, Robert G.; deceased (by Nordquist, Mattie L.; executrix), to Grimes Manufacturing Company. Square lite projector using prismatic lens. 3,732,417, Cl. 240-413.000.

Norman, Philip, to Westinghouse Brake and Signal Company Limited. Fluid pressure operable brake control valves. 3,731,982, Cl. 303-33.000.

Noro, Yoshihiko: *See*—
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Norris, William P., to United States of America, Navy. Ethyl (4-trifluoromethyl-2,3,5,6-tetrafluorophenyl) cyanoacetate. 3,732,278, Cl. 260-465.00d.

North American Equipment Corporation: *See*—
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North American Rockwell Corporation: *See*—
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Norton, Richard V. Process for separation of terephthalonitrile. 3,732,280, Cl. 260-465.00c.

Novak, Phillip J., to Sperry Rand Corporation. Keyswitch. 3,732,390, Cl. 200-168.00g.

Nozawa, Hideyo: *See*—
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Nussbaum, Ralph W.: *See*—
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Nutter, Harry A.: *See*—
Kuehl, Donald K.; Nutter, Harry A.; and Smart, Raymond C., 3,731,651.

Nuzzo, Gary J. Apparatus for producing concrete blocks with undercut portions. 3,731,899, Cl. 249-142.000.

N.V. Electromotorenfabriek Dordt: *See*—
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N.V. Rubberfabriek Vredestein: *See*—
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Obland, Donald R. Computer-controlled article merchandising system for prescription drugs and like articles. 3,732,544, Cl. 340-172.500.

O'Brien, John B.; Stone, Herman; and Ulmer, Harry E., to Allied Chemical Corporation. Chloro-N,N-disubstituted amino methylene amino-s-triazines. 3,732,220, Cl. 260-249.800.

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Offenbroich, Adrian Gottfried. Fastening devices. 3,731,958, Cl. 287-189.36h.

Ogura, Haruo; Itoh, Tsuneo; Takayanagi, Hiroaki; Yamazaki, Yukio; and Takagi, Hiromu, to Sankyo Company Limited and Kodama Limited. 2-(p-Bromophenyl)-9-dimethylaminopropyl-9H-imidazo [1,2-a]benzimidazole. 3,732,243, Cl. 260-309.200.

Ohara, Jiro: *See*—
Niki, Akiri; Hirose, Satoshi; and Ohara, Jiro, 3,731,820.

Ohira, Mitsuo; Sagawa, Kouiti; Hata, Ikuo; and Sasai, Goro, to Hitachi, Ltd. Electric vacuum cleaner. 3,731,465, Cl. 55-299.000.

Ohkita, Masao, to Alps Electric Co., Ltd. Alternate action switch with binding preventing arrangement. 3,732,386, Cl. 200-153.00j.

Oishi, Masaaki; Takahashi, Yoshinaga; and Yoshizawa, Keiichi, to Kabushiki Kaisha Hattori Tokeiten. Rotational angle detecting device. 3,732,449, Cl. 310-259.000.

Okada, Katsuto; and Kato, Fumio, to Morinaga Nyugyo Kabushiki Kaisha. Method of and apparatus for fluidizing particulate substance. 3,731,393, Cl. 34-10.000.

Okagaki, Hirosi; Arai, Yoji; Tomita, Sadami; and Hosoya, Akira, to Hitachi, Ltd. Glow discharge tube for atomic light-absorption analysis. 3,732,454, Cl. 313-209.000.

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Okamoto, Miyoshi; Watanabe, Koji; Ashida, Keiichi; Toyohiko, Hikota; Mizuguchi, Shungi; and Kounosu, Makoto, to Toray Industries, Inc. Method of manufacturing a fibrous sheet. 3,731,352, Cl. 28-72.20r.

Okamoto, Tadashi: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,732,285.

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Olenzak, Albert T.: *See*—
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O'Mary, Hollis W.; and Morris, James L., to United States of America, Army. Pulse doppler signal simulator. 3,732,568, Cl. 343-17.700.

Omron Tateisi Electronics Co.: *See*—
Hatano, Isao; Nagano, Akira; and Koya, Kiyoshi, 3,732,545.

O'Neill , Charles T.: *See*—
Curtis, Omer E., Jr.; Tuller, Harold W.; O'Neill , Charles T.; and Nussbaum, Ralph W., 3,732,332.

O'Neill, Jack E. Combination dry and wet suit. 3,731,319, Cl. 2-2.10r.

Onishi, Masayuki, to Tokyo Shibaura Electric Co., Ltd. Centrifugal dehydrator. 3,731,394, Cl. 34-58.000.

Ono, Shigeo; and Hamaguchi, Ichiro, to Nippon Kogaku K.K. Automatic exposure time control device for cameras. 3,731,603, Cl. 95-10.0ct.

Onouchi, Hiromichi: *See*—
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Oomori, Isoshi; and Suzue, Kiyoyuki, to Hitachi Chemical Company, Ltd. Process for producing citric acid. 3,732,145, Cl. 195-30.000.

Ort, Wolfgang; and Brauning, Gerhard, to Eastman Kodak Company. Apparatus for igniting percussively or electrically fireable flash units. 3,732,058, Cl. 431-93.000.

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Osborne, Michael Bryon, to Kingston Conveyors Limited. Conveyors. 3,731,784, Cl. 198-31.0ab.

Osuro, Tomokatsu; Watanabe, Mitsuru; Takatsuki, Hideo; Okamoto, Kunihiko; and Suda, Teruo, to Hitachi, Ltd. Magnetrons. 3,732,459, Cl. 315-39.510.

Otis Engineering Corporation: *See*—
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Ott, Robert W., Jr., to Rockford Servo Corporation. Web guide roller assembly. 3,731,864, Cl. 226-19.000.

Ottmann, Gerhard F.; Poth, Hans-Ulrich; and Holfort, Horst, to Herberts, Kurt, Dr., & Co., vorm Otto Louis Herberts. Process and composition for the production of insulating solderable coatings. 3,732,168, Cl. 252-63.700.

Oura, Yoshifumi: *See*—
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Outboard Marine Corporation: *See*—
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Rolston, John A., 3,731,792.

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Oxy Metal Finishing Corporation, mesne: *See*—
Minbiole, Louis J., Jr.; Clark, Chester G.; and Neumann, John W., 3,731,647.

Ozaki, Atsumu; Mizoroki, Tsutomu; and Maruya, Ken-Ichi, to Tokyo Institute of Technology, President of. Method of producing 3-phenyl-1-butene. 3,732,323, Cl. 260-668.00b.

Ozeki, Mamoru: *See*—

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Pagano, Samuel J. Self-threading knot-tying device. 3,731,960, Cl. 289-17.000.
Painley, Elmer F.; Last, Bernard; and Dym, Joseph B., to Rockwell Manufacturing Company. Housing structure for meters. 3,731,534, Cl. 73-273.000.
Palermo, Carmen J.: *See—*
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Palitex Project Company: *See—*
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Palmer, Harold A.; and Sample, Thomas E., Jr., to Texaco Inc. Secondary oil recovery process using oxyalkylated additives. 3,731,741, Cl. 166-272.000.
Palmer, Ronald S., to Walton, Charles A. Electronic sensing and actuator system. 3,732,465, Cl. 317-134.000.
Pan-Nova, Inc.: *See—*
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Panduit Corporation: *See—*
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Paris, Rene A.; Thibaudon, Dominique; Roubin, Marc P.; and Paris, Jacques M., to Agence Nationale de Valorisation de la Recherche (Anvar). Method for preparing mutual dispersions of carbides and metals or alloys and novel products thereof. 3,732,091, Cl. 7-.5ac.
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Parvin, Don M. Shoe with nerve and muscle relaxant. 3,731,674, Cl. 128-25.00b.
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Pepmeier, Carl R.; Burke, David C.; and Jones, Allen P., to FMC Corporation. Apparatus for determining coating adhesion properties of hydrophobic surfaces. 3,731,529, Cl. 73-150.000.
Perhats, Frank J. Clutch and brake motor arrangement. 3,732,447, Cl. 310-76.000.
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Petrie, William E. Collapsible tree stand. 3,731,895, Cl. 248-48.000.
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Pfeiffer, Rolf D.; and Gruenberg, Wolf, to Honeywell G.m.b.H. Method of and apparatus for automatically clearing a directive gun from obstacle. 3,731,589, Cl. 89-41.00c.
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Phares, Michael W.; and Young, Paul E., to Pillsbury Company, The. In-feed for automatic cut-up saw. 3,731,344, Cl. 17-11.000.
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Platt, Steven; and Pomeranz, Jehoshua N., to International Business Machines Corporation. Address decoder latch. 3,732,440, Cl. 307-289.000.
Platte, Robert F. Emergency warning light switching system. 3,732,540, Cl. 340-76.000.
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Platz, Rolf; Decker, Martin; Buerger, Gert; and Stechl, Hans-Helge, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Separating phthalonitriles from reaction gases containing the same. 3,732,275, Cl. 260-465.00b.
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Post, Jeffrey G.; and Smith, Neal F., to Quaker Oats Company, The. Ready-to-eat oat cereal biscuit. 3,732,109, Cl. 99-83.000.
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Popp, Jurgen; and Wappes, Lieselotte, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Filament-forming synthetic linear polyesters modified by sulfonate groups. 3,732,183, Cl. 260-75.00p.
Porteous, Don D. Method for preparing syringe type vials of hydrocolloid impression material. 3,731,453, Cl. 53-37.000.
Porteus, John H. Method of and apparatus for reducing air pollution in the thermal processing of ores and other materials. 3,732,062, Cl. 432-16.000.
Potash, Norman, to United States of America, Army. Canteen for use with a gas mask. 3,731,717, Cl. 141-379.000.
Poth, Hans-Ulrich: *See—*
Ottmann, Gerhard F.; Poth, Hans-Ulrich; and Holfort, Horst, 3,732,168.
Poulain, Jean Armand; and Chaboseau, Jacques Pierre, to Societe Rateau. Gas turbines. 3,731,486, Cl. 60-39.51r.
Power Technology Corporation: *See—*
Hill, Charles C., 3,731,483.
Pratt, Chapin A.: *See—*
Godwin, Gilbert Alan; and Pratt, Chapin A., 3,731,754.
Prem, Dorothy C.: *See—*
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Pressley, Thomas A.; and Bishop, Dolloff F., Jr., to United States of America, Environmental Protection. Nitrogen removal from waste water by breakpoint chlorination. 3,732,164, Cl. 210-60.000.
Pressman, David Roy: *See—*
Loe, James M., 3,731,670.
Price, Allan S. Camera bracket. 3,731,897, Cl. 248-230.000.
Prikhna, Alexei Iosifovich: *See—*
Bakul, Valentin Nikolaevich; Prikhna, Alexei Iosifovich; and Shulzhenko, Alexandr Alexandrovich, 3,732,043.
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Prutton, Edward A.: *See—*
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Przybyszewski, John S.; and Shaltens, Richard K., to United States of America, National Aeronautics and Space Administration. Method and apparatus for sputtering utilizing a apertured electrode and a pulsed substrate bias. 3,732,158, Cl. 204-192.000.
Puerner, George O.: *See—*
Hauenstine, Edgar F.; and Puerner, George O., 3,732,521.
Puetz, Jordan F., to Square D Company. Compact cartridge-type fuse holder. 3,732,516, Cl. 337-194.000.
Pullis, George R.: *See—*
Mason, Roger S.; and Pullis, George R., 3,731,866.
Punako, Stephen, to Bendix Corporation, The. Electrical connector with improved cable support. 3,732,526, Cl. 339-101.000.
Puttick, Donald W. Trip mechanism. 3,732,512, Cl. 335-302.000.
Pyramid Enterprises, Inc.: *See—*
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Pyzel, Phyllis: *See—*
Pyzel, Robert, 3,731,678.
Pyzel, Robert, 1/2 to Pyzel, Phyllis. Smoke inhalation protector. 3,731,678, Cl. 128-147.000.
Quaker Oats Company, The: *See—*
Hostettler, Fritz; and Huffman, George W., 3,732,176.
Post, Jeffrey G.; and Smith, Neal F., 3,732,109.
Quanrud, John W. Harvesting machine. 3,731,569, Cl. 83-356.300.
QVA Corporation: *See—*
Lindelof, Leonard A., 3,731,975.
Rabek, Elmer E., to Reliance Electric Company. Combination fitting. 3,731,541, Cl. 73-493.000.
Rackman, Michael I.; and Matthew, Morton P. Action game. 3,731,924, Cl. 273-1.00e.
Radiation, Inc.: *See—*
McRae, Daniel D.; Palermo, Carmen J.; and Pelchat, Majella G., 3,732,495.
Radke, Donald G., to Allied Chemical Corporation. Flat bag made of tubular sections. 3,731,949, Cl. 280-150.0ab.
Radscheit, Kurt: *See—*
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Lupke, Kurt; Ragg, Uban; and Diessel, Gunter, 3,732,027.
Rails Company, The: *See—*
Burwell, Garwood N., 3,731,875.
Raitport, Eli. Apparatus for cleansing soft or hard goods. 3,731,908, Cl. 259-4.000.
Raley, Charles F., to Dow Chemical Company, The. Process for making alpha-haloalkenylaromatics. 3,732,321, Cl. 260-561.00r.
Ralston Purina Company: *See—*
Long, Ronald W., 3,732,121.
Walters, Roger E., 3,732,113.
Ramanathan, Visvanathan, to Ciba-Geigy AG. 3-Chloro-1,2,4-thiadiazolyl 5- and 3-chloro-1,2, 4-thiadiazolium-5 azo dyestuffs. 3,732,201, Cl. 260-153.000.
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Rando, Frederick D.; and Rogers, William P., to Ultronic Systems Corporation. Selective blanking of video display. 3,732,365, Cl. 178-6.800.
Rank, Carleton L.; and Ryan, Ray T., to Metradon Associates. Soil stabilization apparatus. 3,732,023, Cl. 94-40.000.
Rankin, David: *See—*
Mantell, Gerald J.; Smith, Wayne E.; Galiano, Francis R.; and Rankin, David, 3,732,333.
Rannenberg, George C., to United Aircraft Corporation. Function generator transducer. 3,731,594, Cl. 92-36.000.
Rapp, Werner; and Albrecht, Werner. Proximity switch including variable frequency oscillator with ferrite control element. 3,732,503, Cl. 331-65.000.
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Rauh, James, to Stanson, Milton R. and Rauh, James. Particulate material dispenser. 3,731,851, Cl. 222-213.000.
Ray, Neil Hunter; and Sherliker, Francis Raymond, to Imperial Chemical Industries Limited. Polymer composites reinforced with low-melt glass. 3,732,181, Cl. 260-41.00b.
Rayburn, Charles C., to Illinois Tool Works Inc. Method of making a multilayer plastic chip capacitor. 3,731,354, Cl. 29-25.420.
Raymond, James R.; and Thomson, Clarence I., III, to Westinghouse Electric Corporation. Compact heat exchanger. 3,732,029, Cl. 415-111.000.
Raytheon Company: *See—*
Ehrlich, Stanley L., 3,732,535.
Razdan, Raj K.: *See—*
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Reade, Richard F., to Corning Glass Works. Glass-ceramic articles containing strontia-, yttria-, lanthana-, and/or tantala-bearing crystal species. 3,732,116, Cl. 106-39.7mp.
Reba, Imants; and Wolthausen, Edward C., to Black Clawson Company, The, mesne. Coating doctor apparatus. 3,731,652, Cl. 118-63.000.
Rebold, Jerome I., 1/3 to Bloom, Leonard. Portable compact electric douche. 3,731,676, Cl. 128-66.000.
Reed, Alan B.; and Eckart, George R., to Woodhead, Daniel, Inc. Electrical receptacle with safety cover. 3,732,524, Cl. 339-44.00r.
Reed, Robert D.: *See—*
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Reese, Albert W. Wedge-cutting machine including template and hold-down. 3,731,721, Cl. 144-253.00e.
Regel, Erik; Eue, Ludwig; and Buchel, Karl Heinz, to Farbenfabriken Bayer Aktiengesellschaft. Process for the preparation of imidazoisoquinolinedione compounds. 3,732,232, Cl. 260-288.00r.
Reid, Robert J. C.; and Crate, Graham F., to Trans-Canada Pipe Lines Limited. Control system for compressors operating in parallel. 3,732,034, Cl. 417-6.000.
Reider, Alois: *See—*
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Reiffel, Leonard, to Instructional Dynamics, Inc. Method and apparatus for producing animated motion pictures. 3,731,995, Cl. 352-87.000.
Reimer, Alfred. Conveyor. 3,731,636, Cl. 104-172.00b.
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Renk, Rolf, to General Motors Corporation. Gearshift arrangement for a motor vehicle change-speed gear. 3,731,554, Cl. 74-477.000.
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Rias, Jean Claude, to Cogar Corporation. Process and apparatus for continuous packaging of products and objects. 3,731,452, Cl. 53-29.000.
Rice, George B.: *See—*
Merrow, Raymond T.; Julian, Elmo C.; Eldridge, Judson B.; Rice, George B.; Dow, Robert L.; Rodgers, Charley R.; and Stull, Bertram O., 3,732,132.
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Richter, John G.: *See—*
Wolf, Arnold M.; and Richter, John G., 3,731,780.
Rickert, Sherwood A. Filter apparatus. 3,731,808, Cl. 210-138.000.
Ricoh Co., Ltd.: *See—*
Kaneko, Tamaki; and Mizuno, Katsumi, 3,731,624.
Ripley Company, Inc.: *See—*
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Ris, Kenneth B.; and Huber, Ferdinand V., to Ecodyne Corporation. Adjustable selective orificing steam condenser. 3,731,734, Cl. 165-100.000.
Ris, Kenneth B., to Ecodyne Corporation, mesne. Selective orificing steam condenser. 3,731,735, Cl. 165-110.000.
Risko, Richard C., to General Motors Corporation. Occupant restraint system. 3,731,948, Cl. 280-150.0ab.
Ritchie, Robert C.: *See—*
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Rizza, Michael C.; and Brown, Delmont D., to Brown, D. S., Company, The. Modular expansion joint. 3,732,021, Cl. 404-51.000.
Robaszkiewicz, Gerald D., to Reliance Electric Company. Multiple digital comparator. 3,731,765, Cl. 187-29.00r.
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Robinson, Preston. Electrolytic device and semiconductor oxide electrolyte therefor. 3,732,470, Cl. 317-230.000.
Rocco, Thomas J., Jr. Glove and ball tethered thereto. 3,731,927, Cl. 273-26.00e.
Rocheleau, Antoni A.: *See—*
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Rocher, Edouard Y.; and Schuster, Stanley E., to International Business Machines Corporation. Communication system and method. 3,732,374, Cl. 179-15.0al.
Rocher, Edouard Y.; and Schuster, Stanley E., to International Business Machines Corporation. Loop switching teleprocessing method and system using switching interface. 3,732,543, Cl. 340-172.500.
Rockford Servo Corporation: *See—*
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Rockwell Manufacturing Company: *See—*
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Painley, Elmer F.; Last, Bernard; and Dym, Joseph B., 3,731,534.
Roder, Georg, to Messer Griesheim GmbH. Device for raising and lowering the torches of a flame cutting machine. 3,731,911, Cl. 266-23.00m.
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Merrow, Raymond T.; Julian, Elmo C.; Eldridge, Judson B.; Rice, George B.; Dow, Robert L.; Rodgers, Charley R.; and Stull, Bertram O., 3,732,132.
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Rolston, John A., to Owens-Corning Fiberglas Corporation. Non-slumping glass fiber package. 3,731,792, Cl. 206-52.00w.
Romero, Antonio S., 33 1/3 to Witt, Boston E. Broken sprinkler standpipe removing tool. 3,731,364, Cl. 29-240.000.
Ronkin, David G.; and Schwartz, David J. Information storage and retrieval system. 3,732,546, Cl. 340-172.500.
Roseman, Theodore: *See—*
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Ross, Cray L. Method and a machine for cutting open ended or blind cavities. 3,731,567, Cl. 83-1.000.
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Rotablock Limited: *See—*
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Roth, Gerald A., to Swift & Company. Flame retardants for flexible foamed plastic. 3,732,265, Cl. 260-408.000.
Rottleuthner, Heinz H., to Amtel, Inc. Roller burnishing tool. 3,731,355, Cl. 29-90.000.
Roubin, Marc P.: *See—*
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Dupuy, Michel Jean-Marie, 3,732,506.
Rowland, Stanley P.; Roberts, Earl J.; and Wade, Clinton P., to United States of America, Agriculture. N,N-diethylaziridinium chloride as a coreactant catalyst for reactions of N-methylol reagents with cellulose. 3,732,073, Cl. 8-183.000.
Royal Seven Inc.: *See—*
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Rubin, James M. Toothbrush. 3,731,336, Cl. 15-167.00r.
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Ruoff, Laurence J.; and Brewer, Lani W., to Data Handling Corporation. Digital magnetic tape transports. 3,731,890, Cl. 242-188.000.

Rusco, Harvey H. Power driven auger attachment for snowmobiles. 3,731,751, Cl. 173-25.000.

Rushing, Frank C.; and Aulthouse, Robert R., to Westinghouse Electric Corporation. Self-starting synchronous integrated motor-wheel drive. 3,732,357, Cl. 178-5.4cf.

Russell, George E. Water ski with venturi channel and means for securing foot retainers. 3,731,328, Cl. 9-310.0aa.

Russell, Herman F. Trimming guide for meat. 3,731,579, Cl. 83-802.000.

Russell, William S.: *See—*
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S. A. Francois Salomon et Fils: *See—*
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Sabatini, Bruno; and Tarokh, Mahmoud, to British Iron and Steel Research Association, The. Rolling of strip or plate material. 3,731,508, Cl. 72-9.000.

Sabelman, Eric E.: *See—*
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Sacks, Jack, to United Recording Electronic Industries. Equalizer utilizing a comb of spectral frequences as the test signal. 3,732,370, Cl. 179-1.00d.

Sadoski, Tadius T.: *See—*
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Saenger, Herman H. Hanger assembly for supporting a plurality of clothes hangers. 3,731,809, Cl. 211-118.000.

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Saito, Reiji: *See—*
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Sakabe, Masaya; Kobinata, Eiichi; and Takaoka, Masaru, to Mitsubishi Petrochemical Company, Limited. Molding apparatus for producing resinous thermoplastic articles. 3,732,051, Cl. 425-407.000.

Salomon, Georges Pierre Joseph, to S. A. Francois Salomon et Fils. Fixing ski boots to skis. 3,731,944, Cl. 280-11.35c.

Salvati, Mary. Face lifting technique. 3,731,677, Cl. 128-76.00b.

Sample, Thomas E., Jr.: *See—*
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Sampson, William B.: *See—*
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Sanders Nuclear Corporation: *See—*
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Sandhage, Ellsworth Roland. Diagnostic agents storage. 3,731,819, Cl. 211-74.000.

Sandoz Ltd.; a/k/a Sandoz AG: *See—*
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Santa Barbara Research Center: *See—*
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Santero, Giovanni, to Societa Farmaceutici Italia. Apparatus for the large scale growth of living cells. 3,732,149, Cl. 195-139.000.

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Santilli, Arthur A.; and Kim, Dong H., to American Home Products Corporation. 4-[(2-Cyanoethyl)amino]-2-phenyl-5-pyrimidine carboxylic acid esters. 3,732,226, Cl. 260-256.40n.

Sapkus, Jurgis: *See—*
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Sardi, Anna: *See—*
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Sargent, Charles L.; and Hoffman, John A., to Thermasan Corporation. Dual waste disposal system and method. 3,731,490, Cl. 60-317.000.

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Sasakura Engineering Co., Ltd.: *See—*
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Sasakura, Tetsugoro; and Moriya, Seishi, to Sasakura Engineering Co., Ltd. Method of condensing turbine exhaust at the power plant. 3,731,488, Cl. 60-95.000.

Sato, Akihiko: *See—*
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Sato, Ryoda. Transformers. 3,732,514, Cl. 336-172.000.

Sato, Yoshihito: *See—*
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Sauer, J. P., & Sohn, GmbH: *See—*
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Scallet, Barry L.: *See—*
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Schaar, Charles H., to Kendall Company, The. Disposable diaper having an integral container and means for application. 3,731,689, Cl. 128-287.000.

Schad, Charles A., to Kalium Chemicals Limited. Magnetic detection and magnetometer system therefor. 3,731,752, Cl. 175-45.000.

Schafer, Karl: *See—*
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Schaible, Siegfried: *See—*
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Schenck, Carl, Maschinenfabrik GmbH: *See—*
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Schenkir, Ludwig; and Dultinger, Josef, to Plasser, Franz, Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast compacting and leveling apparatus. 3,731,409, Cl. 37-104.000.

Scher, Herbert I.; Ungar, Israel S.; and McQuade, John E., Jr., to Esso Research and Engineering Company. Preparation of high pressure decorative laminates having registered color and embossing using encapsulated ink. 3,732,137, Cl. 161-2.000.

Scherer, Carl A.: *See—*
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Schiethart, Lodewijk, to N.V. Electromotorenfabriek Dordt. Synchronous electric motor. 3,732,448, Cl. 310-162.000.

Schild, A., S.A.: *See—*
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Schlaf, Stanley O. Vending machine with screw conveyor type cellular magazine. 3,731,841, Cl. 221-75.000.

Schlatter, Gerald Lance, to International Telephone and Telegraph Corporation. Analog multiplier and square root extractor having a plurality of strain gages connected in a bridge circuit. 3,732,406, Cl. 235-151.340.

Schlegel, James E., to International Harvester Company. Seed selector for planter. 3,731,842, Cl. 221-278.000.

Schliemann, Louis F.; and Borgos, Jerome E. Table assembly. 3,731,639, Cl. 108-157.000.

Schlumberger Technology Corporation: *See—*
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Schlums, Karl-Dieter, to Braunschweigische Maschinenbauanstalt. Universal joint coupling. 3,731,500, Cl. 64-14.000.

Schmidt, Frederick W.; and Hamilton, William P., to Horizons Incorporated. Photographic developing device. 3,731,612, Cl. 95-89.00r.

Schmidt, Frederick W., to Horizons Incorporated; a division of Horizons Research Incorporated. Red light development of free radical system within 50 nanometers. 3,732,098, Cl. 96-48.00r.

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Strenglein, Harry F., to Sperry Rand Corporation. Selective intrusion alarm system. 3,732,555, Cl. 340-258.00b.

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Stubits, Marcella C.: *See—*
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Studli, Hans. Apparatus for the manufacture of granulated material. 3,732,049, Cl. 425-192.000.

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Sugeno, Koji, to Suzuei Co., Ltd. Separator for forcing fluids by pipeline. 3,731,701, Cl. 137-268.000.

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Suling, Carlhans, to Farbenfabriken Bayer Aktiengesellschaft. Filaments and films of acrylonitrile polymers which are free from vacuoles. 3,732,339, Cl. 260-898.000.

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Sullivan, James Franklin; and Arnold, Loren Glenn, to Deere & Company. Towed plow. 3,731,749, Cl. 172-401.000.

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Symaniec, Leonides; Pepin, Christian; and Skenderoff, Claude, to Thomson-CSF. Spectrum analysis systems using optical correlation techniques particularly useful in pulse modulated doppler radar systems. 3,732,565, Cl. 343-9.000.

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Tack, Carl E. Resiliently frictionally sway stabilized railway car. 3,731,638, Cl. 105-199.00a.
Taguchi, Naoyoshi. Semiconductor gas detecting device. 3,732,519, Cl. 338-34.000.
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Webbere, Fred J.; and Williams, Robert G., to General Motors Corporation. Mold apparatus for continuous casting. 3,731,728, Cl. 164-281.000.

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Wollner, Johannes; Cherubim, Martin; and Henn, Friedrich, to Deutsche Texaco Aktiengesellschaft. Process for the production of plastics and lacquer resins from basic nitrogen-containing glycidyl compounds and dicarboxylic anhydrides. 3,732,331, Cl. 260-8300tw.
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Continental Oil Co.: *See*—
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Du Pont de Nemours, E. I., & Co.: *See*—
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Ertle, Raymond T.: *See*—
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Leach, Bruce E. and W. C. Ziegenhain, to Continental Oil Co. Alumina filtration. T910,008, 5–8–73, Cl. 210—54.

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Schuman, Leonard J., R. P. Brookman, and R. T. Ertle, to Continental Oil Co. Methods for preparation of insulation materials from alumina-silica fibers. T910,006, 5–8–73, Cl. 162—152.

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LIST OF REISSUE PATENTEES

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Logan, Campbell F. Inflatable float boom. Re. 27,640, 5–8–73, Cl. 61—1.

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238 3,731,463
270 3,731,464
299 3,731,465
386 3,731,466
459 3,731,467

CLASS 56
1 3,731,468
7 3,731,469
10.4 3,731,470
10.5 3,731,471
11.3 3,731,472
14.4 3,731,473
27.5 3,731,475
237 3,731,476
327R 3,731,477

CLASS 57
58.7 3,731,478
131 3,731,479

CLASS 58
23C 3,731,474
34 3,731,481
116R 3,731,480
127B 3,731,482

CLASS 60
39.05 3,731,485
39.16R 3,731,483
39.23 3,731,484
39.51R 3,731,486
54.6E 3,731,487
95 3,731,488
226A 3,731,489
317 3,731,490

CLASS 61
1F Re.27,640
3,731,491
30 3,731,492
35 3,731,493

CLASS 62
39 3,731,495
137 3,731,496
157 3,731,494
160 3,731,497
225 3,731,498

CLASS 64
11R 3,731,499
14 3,731,500
17R 3,731,501

CLASS 65
28 3,732,086
33 3,732,087
261 3,732,088

CLASS 68
198 3,731,502
205R 3,731,503

CLASS 70
58 3,731,504
63 3,731,505
97 3,731,506
358 3,731,507

CLASS 71
8 3,732,089
37 3,732,090

CLASS 72
9 3,731,508
60 3,731,509
71 3,731,510
92 3,731,511
203 3,731,512
295 3,731,513
306 3,731,514
354 3,731,516
367 3,731,515
3,731,517
402 3,731,518
468 3,731,519

CLASS 73
1E 3,731,521
19 3,731,522
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45.1 3,731,524
49.5 3,731,525
71.4 3,731,526
73 3,731,520
119A 3,731,527
147 3,731,528
150 3,731,529
153 3,731,530
189 3,731,531
194A 3,731,532
231R 3,731,533
273 3,731,534
342 3,731,535
351 3,731,536
382 3,731,537
3,731,538
421.5R 3,731,539
425.6 Re.27,637
457 3,731,540
493 3,731,541
504 3,731,543
516R 3,731,542

CLASS 74
5.22 3,731,544
24 3,731,545
63 3,731,546
89.15 3,731,547
96 3,731,548
230.17A 3,731,549
242.3 3,731,550
257 3,731,551
393 3,731,552
459 3,731,553
477 3,731,554
491 3,731,555
573 3,731,556
792 3,731,557
867 3,731,558

CLASS 75
.5AC 3,732,091
.5BA 3,732,092
66 3,732,093
101R 3,732,094
211 3,732,095

CLASS 81
3F 3,731,559
9.5A 3,731,561
90C 3,731,560

CLASS 82
1.2 3,731,562
14A 3,731,563
31 3,731,564
34R 3,731,565
38R 3,731,566

CLASS 83
1 3,731,567
23 3,731,568
344 3,731,575
356.3 3,731,569
370 3,731,570
420 3,731,571
471.003 3,731,572
544 3,731,573
558 3,731,574
587 3,731,576
599 3,731,577
731 3,731,578
802 3,731,579

CLASS 84
403 3,731,580
471 3,731,581
478 3,731,582

CLASS 85
13 3,731,583

CLASS 86
1 3,731,584
3,731,585

CLASS 88
1.5R 3,731,586

CLASS 89
1K 3,731,588
1R 3,731,587
41C 3,731,589
163 3,731,590

CLASS 90
1.6 3,731,591

CLASS 91
411A 3,731,592
487 3,731,593

CLASS 92
36 3,731,594
37 3,731,595
52 3,731,596
120 3,731,597
122 3,731,599
125 3,731,598

CLASS 93
58.1 3,731,600

CLASS 95
4.5 3,731,610
10CE 3,731,601
10CT 3,731,602
3,731,603
3,731,604
11R 3,731,605
18P 3,731,606
3,731,607
42 3,731,608
3,731,609
62 3,731,611
89R 3,731,612

CLASS 96
1.5 3,732,096
29R 3,732,099
35.1 3,732,097
38.4 3,732,100
48R 3,732,098
76C 3,732,101
94 3,732,102
109R 3,732,103
109 3,732,104
115P 3,732,105
3,732,107
115R 3,732,106

CLASS 99
2E 3,732,108
83 3,732,109
116 3,732,110
140R 3,732,111
150R 3,732,112
174 3,732,113
192 3,732,114
275 3,731,613
404 3,731,614
559 3,731,615

CLASS 100
126 3,731,616
215 3,731,617
229A 3,731,618

CLASS 101
4 3,731,619
23 3,731,620
92 3,731,621
93C 3,731,622
114 3,731,623
142 3,731,624

CLASS 102
24R 3,731,625
27R 3,731,626
49.2 3,731,627
49.3 3,731,628
49.7 3,731,629
52 3,731,630
64 3,731,631
65 3,731,632
67 3,731,633
103 3,731,634

CLASS 104
1R 3,731,635
172B 3,731,636
3,731,637

CLASS 105
199A 3,731,638

CLASS 106
19 3,732,115
39.7 3,732,116
73.2 3,732,117
309 3,732,118

CLASS 108
157 3,731,639

CLASS 110
18R 3,731,640

CLASS 112
25 3,731,641
3,731,642
221 3,731,643

CLASS 114
61 3,731,644
162 3,731,645
206A 3,731,646

CLASS 115
1R Re.27,642

CLASS 117
1.7 3,732,119
16 3,732,120
36.8 3,732,141
65.2 3,732,121
122PF 3,732,122

CLASS 118
5 3,731,647
6 3,731,648
3,731,649
48 3,731,650
49.5 3,731,651
63 3,731,652
429 3,731,653
504 3,731,654
624 3,731,655
637 3,731,656

CLASS 119
17 3,731,657
61 3,731,658

CLASS 123
32EA 3,731,659
41.42 3,731,660
43C 3,731,661
50B 3,731,662
98 3,731,663
102 3,731,664
136 3,731,665
179H 3,731,666
198DB 3,731,667

CLASS 126
92R 3,731,668

CLASS 128
1R 3,731,669
3,731,670
2.05R 3,731,671
2.06A 3,731,672
20 3,731,673
25B 3,731,674
62A 3,731,675
66 3,731,676
76B 3,731,677
147 3,731,678
214E 3,731,680
214F 3,731,679
3,731,681
239 3,731,682
268 3,731,683
275 3,731,684

284 3,731,685
285 3,731,686
3,731,687
287 3,731,688
3,731,689
303.1 3,731,690
351 3,731,691
3,731,692

CLASS 131
21B 3,731,693

CLASS 132
118 3,731,694

CLASS 133
6 3,731,695

CLASS 134
19 3,732,123
80 3,731,696
138 3,731,697

CLASS 135
62 3,731,698

CLASS 136
13 3,732,124
162 3,732,125

CLASS 137
268 3,731,701
343 3,731,702
384.2 3,731,703
612.1 3,731,704
614.06 3,731,705
624.27 3,731,706
625.66 3,731,707
809 3,731,699
824 3,731,708
833 3,731,700

CLASS 138
37 3,731,709
143 3,731,710
178 3,731,711

CLASS 139
122R 3,731,713
122W 3,731,712
302 3,731,714

CLASS 141
107 3,731,715
117 3,731,716
379 3,731,717
384 3,731,718

CLASS 144
2Z 3,731,719
3D 3,731,720
253E 3,731,721

CLASS 145
50DA 3,731,722
129 3,731,723

CLASS 148
11.5R 3,732,126
12.4 3,732,127
159 3,732,128

CLASS 149
2 3,732,129
18 3,732,130
3,732,131
19 3,732,132

CLASS 151
7 3,731,724
22 3,731,725

CLASS 156
6 3,732,133
58 3,732,134
72 3,732,135
3,732,136

CLASS 161
2 3,732,137
43 3,732,138
170 3,732,139
175 3,732,140

CLASS 162
374 3,732,142

CLASS 164
7 3,731,726
154 3,731,727
281 3,731,728

CLASS 165
16 3,731,729
22 3,731,730
46 3,731,731
100 3,731,734
110 3,731,735
161 3,731,733
166 3,731,736
167 3,731,737
180 3,731,738
181 3,731,732

CLASS 166
.5 3,731,739
120 3,731,740
272 3,731,741
304 3,732,166
315 3,731,742

CLASS 169
2R 3,731,743

CLASS 172
7 3,731,744
3,731,745
9 3,731,746
311 3,731,747
314 3,731,748
401 3,731,749
457 3,731,750

CLASS 173
26 3,731,751

CLASS 174
10 3,732,352
68B 3,732,353
78 3,732,354

CLASS 175
6 3,732,143
45 3,731,752
285 3,731,753

CLASS 177
165 3,731,754

CLASS 178
5.1 3,732,355
5.4AC 3,732,358
5.4CD 3,732,361
5.4CF 3,732,357
5.4H 3,732,359
5.4R 3,732,356
3,732,360
6.6DD 3,732,362
6.6TP 3,732,363
6.6A 3,732,364
6.8 3,732,365
3,732,366
3,732,367
7.81 3,732,368
18 3,732,369

CLASS 179
1D 3,732,370
3,732,373
1R 3,732,371
2A 3,732,372
15AL 3,732,374
15BT 3,732,375
15BY 3,732,376
16EA 3,732,378
18R 3,732,377
91 3,732,379
100.2B 3,732,380
100.2K 3,732,381
182.2R 3,732,382

CLASS 180
5R 3,731,755
6.26 3,731,757
6.5 3,731,756
11 3,731,758

CLASS 181
.5F 3,731,759
31B 3,731,760

CLASS 182
1 3,731,761
142 3,731,762

CLASS 184
7D 3,731,763
15R 3,731,764

CLASS 187
29R 3,731,765

CLASS 188
52 3,731,766
72.2 3,731,767
75 3,731,768
218XL 3,731,769
285 3,731,770
289 3,731,771
345 3,731,772

CLASS 192
41S 3,731,773
45 3,731,774
89R 3,731,775
107M 3,731,776

CLASS 194
4C Re.27,643
13 3,731,777

CLASS 195
29 3,732,144
30 3,732,145
66B 3,732,146
103.5R 3,732,147
109 3,732,148
139 3,732,149

CLASS 197
16 3,731,778
18 3,731,779
49 3,731,780
151 3,731,781

CLASS 198
31AA 3,731,783
31AB 3,731,784
31R 3,731,782
35 3,731,785
40 3,731,786
82 3,731,787
103 3,731,788
160 3,731,789
219 3,731,790

CLASS 200
38R 3,732,383
86R 3,732,384
148R 3,732,385
153J 3,732,386
159R 3,732,387
167A 3,732,389
168C 3,732,388
168G 3,732,390

CLASS 203
44 3,732,150

CLASS 204
52R 3,732,151
56M 3,732,152
95 3,732,153
192 3,732,158
195R 3,732,159
268 3,732,157

CLASS 206
16R 3,731,818
47A 3,731,791
52W 3,731,792
3,731,793
62P 3,731,794

CLASS 208
87 3,732,154
111 3,732,156
210 3,732,155

CLASS 209
73 3,731,795
74 3,731,796
78 3,731,797
98 3,731,798
111.7 3,731,799
211 3,731,800

CLASS 210
14 3,732,160
30 3,732,161
40 3,732,162
47 3,732,163
56 3,731,801
60 3,732,164
71 3,731,802
80 3,731,803
83 3,731,804
86 3,731,805
94 3,731,806
96 3,731,807
138 3,731,808
189 3,731,810
190 3,732,165
194 3,731,811
199 3,731,812
242 3,731,813
411 3,731,814
496 3,731,815
500 3,731,816

CLASS 211
60R 3,731,817
74 3,731,819
118 3,731,809

CLASS 214
1BB 3,731,820
3,731,821
1BC 3,731,822
6F 3,731,823
16B 3,731,824
83.36 3,731,825
84 3,731,826
147G 3,731,827
305 3,731,828
390 3,731,829
450 3,731,830
506 3,731,831

CLASS 215
46A 3,731,832

CLASS 219
67 3,732,391
69C 3,732,392
137 3,732,393
251 3,732,394
388 3,732,395
401 3,732,396
477 3,732,397
536 3,732,398

CLASS 220
24.5 3,731,833
27 3,731,834
53 3,731,835
54 3,731,836
55R 3,731,837
67 3,731,838
74 3,731,839
95 3,731,840

CLASS 221
75 3,731,841
278 3,731,842

CLASS 222
3 3,731,843
67 3,731,845
83 3,731,844
86 3,731,846
94 3,731,847
129 3,731,848
153 3,731,849
193 3,731,850
213 3,731,851
318 3,731,852
386 3,731,853
386.5 3,731,854
394 3,731,855
477 3,731,856

CLASS 223
96 3,731,857

CLASS 224
2B 3,731,858
42.01 3,731,859
42.06 3,731,860

CLASS 225
2 3,731,861
4 3,731,862
20 3,731,863

CLASS 226
19 3,731,864

CLASS 228
6 3,731,866
3,731,867
50 3,731,868

CLASS 229
22 3,731,869
27 3,731,870
3,731,871
37R 3,731,872
41R 3,731,873

CLASS 235
61B 3,732,399
61.11B 3,732,400
61.11E 3,732,401
61.11R 3,732,402
91R 3,731,874
92PE 3,732,403
113 3,732,404
151.31 3,732,405
151.34 3,732,406
153BB 3,732,407
155 3,732,408
164 3,732,409
181 3,732,410
183 3,732,411

CLASS 238
346 3,731,875

CLASS 239
13 3,731,876
102 3,731,877
166 3,731,878
167 3,731,879
585 3,731,880
3,731,881

CLASS 240
1R 3,732,412
2.25 3,732,413
10.61 3,732,414
41SC 3,732,415
41.15 3,732,416
41.3 3,732,417

CLASS 241
46.15 3,731,882
52 3,731,883
222 3,731,884

CLASS 242
68.3 3,731,885
77.1 3,731,886
96 3,731,887
129 3,731,888
156.2 3,731,889
188 3,731,890
195 3,731,891

CLASS 244
1SS 3,731,893
3.16 3,731,892

CLASS 245
6 3,731,894

CLASS 248
9 3,731,896
48 3,731,895
230 3,731,897
328 3,731,898

CLASS 249
142 3,731,899
177 3,731,900
180 3,731,901
210 3,731,902

CLASS 250
65T 3,732,418
71.5S 3,732,419
71.5 3,732,420
83R 3,732,421
83.3R 3,732,422
90 3,732,426
108R 3,732,423
3,732,427
203R 3,732,424
213VT 3,732,428
213R 3,732,429
217S 3,732,425
219FR 3,732,430

CLASS 251
118 3,731,903
315 3,731,904
333 3,731,905

CLASS 252
32.7E 3,732,167
63.7 3,732,168
78 3,732,169
95 3,732,170
105 3,732,171
316 3,732,172

CLASS 254
100 3,731,906

CLASS 259
1R 3,731,907
4 3,731,908
177 3,731,909

CLASS 260
2A 3,732,174
2P 3,732,175
2.5AP 3,732,176
17.2 3,732,177
23EM 3,732,178
24 3,732,179
29.2EP 3,732,173
33.6R 3,732,180
41B 3,732,181
47EN 3,732,286
75P 3,732,183
75R 3,732,182
77.5AM 3,732,186
77.5BB 3,732,184
77.5BF 3,732,187
77.5CH 3,732,185
78UA 3,732,188
78VA 3,732,189
78.5R 3,732,190
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79.3MU 3,732,193
79.5B 3,732,192
82.1 3,732,194
93.7 3,732,196
3,732,197
94.3 3,732,195
94.9C 3,732,198
112.5 3,732,199
144 3,732,200
153 3,732,201
210R 3,732,202
210.5 3,732,203
224 3,732,205
233.3R 3,732,208
233.5 3,732,206
3,732,207
239.3D 3,732,211
239.3T 3,732,212
239.5 3,732,209
239.55R 3,732,210
240CA 3,732,213
240B 3,732,221
240H 3,732,214
243R 3,732,215
3,732,216
3,732,222
247.1 3,732,217
247.5R 3,732,219
248AS 3,732,218
248NS 3,732,220
249.8 3,732,223
3,732,224
251.5 3,732,225
256.4F 3,732,226
256.4N 3,732,227
3,732,228
260 3,732,229
268PH 3,732,204
279R 3,732,230
283R 3,732,231
285.5 3,732,232
288R 3,732,233
293.55 3,732,234
294.8F 3,732,235
295R 3,732,236
296B 3,732,237
302R 3,732,240
306.7 3,732,238
308B 3,732,239
3,732,242
309 3,732,241
309.2 3,732,243
3,732,244
309.6 3,732,245
319.1 3,732,248
325 3,732,246
326C 3,732,249
326.15 3,732,247
326.8 3,732,250
327R 3,732,252
340 3,732,253
340.5 3,732,254
3,732,251
343.2R 3,732,255
343.6 3,732,256
346.3 3,732,257
346.4 3,732,258
348C 3,732,259
396R 3,732,261
397.4 3,732,260
397.45 3,732,262
404.5 3,732,263
407 3,732,264
408 3,732,265
3,732,266
409 3,732,267
413 3,732,268
3,732,269
429.7 3,732,270
438.5C 3,732,271
453R 3,732,272
455A 3,732,273
456R 3,732,274
463 3,732,275
465B 3,732,280
465C 3,732,278
465D 3,732,279
3,732,277
465E 3,732,276
465.8A 3,732,281
465.8D 3,732,282
465.9 3,732,283
466 3,732,284
468R 3,732,285
471C 3,732,287
476R 3,732,288
486H 3,732,289
487 3,732,290
507R 3,732,292
515A 3,732,293
516 3,732,294
518A 3,732,295
519 3,732,296
524R 3,732,297
544M 3,732,298
556B 3,732,299
558A 3,732,301
559H 3,732,300
559S 3,732,303
561A 3,732,302
561N 3,732,321
561R 3,732,304
563R 3,732,305
564R 3,732,306
566AE 3,732,307
566B 3,732,308
570.7 3,732,291
573R 3,732,310
583B 3,732,309
583P 3,732,311
583R 3,732,312
584R 3,732,313
594 3,732,314
599 3,732,315
600 3,732,316
606.5P 3,732,317
607B 3,732,318
607R 3,732,319
614R 3,732,320
637R 3,732,322
654D 3,732,323
668B 3,732,324
671G Re.27,639
672T 3,732,325
674SA 3,732,326
676MS 3,732,328
680B 3,732,327
680E 3,732,329
683.9 3,732,330
825 3,732,331
830TW 3,732,332
837R 3,732,333
874 3,732,334
875 3,732,335
878B 3,732,336
881 3,732,337
897A 3,732,338
897B 3,732,339
898 3,732,340
936 3,732,341
950 3,732,342
3,732,343
951 3,732,344
984

CLASS 264
134 3,732,348
175 3,732,349
210F 3,732,346
231 3,732,347
329 3,732,345

CLASS 266
15 3,731,910
23M 3,731,911
38 3,731,912

CLASS 267
63R 3,731,913
65R 3,731,914

CLASS 271
36 3,731,915
57 3,731,916
74 3,731,918

CLASS 272
56.5 3,731,923
57B 3,731,919
57E 3,731,920
69 3,731,917
71 3,731,921
81 3,731,922

CLASS 273
1E 3,731,924
26E 3,731,925
3,731,926
3,731,927
26R 3,731,928
95A 3,731,929
95R 3,731,930
3,731,931
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DEFENSIVE PUBLICATIONS APPLICATIONS

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162— 152 T910,006

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56 : 3,731,945

DESIGN PATENTS

6	:	226,847			226,879		226,874		226,832		226,852		226,865
		226,848	8	:	226,875	25	: 226,840		226,834		226,853		226,878
		226,855	12	:	226,869		226,841		226,838		226,854	48	: 226,839
		226,856	16	:	226,833		226,863		226,845	40	: 226,850		226,842
		226,858	17	:	226,837	26	: 226,857		226,859	42	: 226,835	53	: 226,870
		226,868			226,872	34	: 226,844		226,880		226,849	55	: 226,836
		226,873			226,877		226,871		226,881		226,864		226,867
		226,876	18	:	226,843	36	: 226,831	39	: 226,851				

PLANT PATENTS

6	:	03,328			03,329		03,330	39	: 03,327		

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

8	:	T910,009	34	:	T910,006	39	: T910,007		T910,010	40	: T910,008

U. S. GOVERNMENT PRINTING OFFICE : O - 1973

U. S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary

PATENT OFFICE
Robert Gottschalk, Commissioner